Golden Gate University Environmental Law Journal

Volume 7
Issue 2 *Pacific Region Edition*

Article 5

June 2014

Water Management: From an Uncertain Present to a Sustainable Future

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WATER MANAGEMENT: FROM AN UNCERTAIN PRESENT TO A SUSTAINABLE FUTURE

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The water management landscape is changing, and lawyers and their clients need to adapt!

I. INTRODUCTION

Adapting California's water management and delivery systems to respond to anticipated climate change presents one of the most significant challenges of the twenty-first century. There is no question that climate change is likely to produce major changes in the amount and frequency of precipitation.[1] Nor is there any question that these changes are likely to exacerbate existing risks of flooding, declining water supply and quality, and damage to the environment.[2] The question is how

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[1] PUB. POLICY INST. OF CAL., CALIFORNIA'S FUTURE: CLIMATE CHANGE (Jan. 2014), *available at* www.ppic.org/content/pubs/report/R_114EHR.pdf.

[2] CAL. NATURAL RES. AGENCY, CAL. ENVTL. PROT. AGENCY & CAL. DEP'T OF FOOD & AGRIC., CALIFORNIA WATER ACTION PLAN 1-3 (2014), *available at*

California will respond to the challenge of updating water management to provide for a more resilient and sustainable future.

Decisions on how to respond to this challenge will involve many participants, including legislators, planners, lobbyists, regulators, and water project developers and operators, as well as many urban, agricultural, and environmental interests. These participants will face very difficult questions about how to make use of limited water resources in the face of climate change.

As these participants respond to these challenges, they are beginning to change the way they address issues of water management. The old traditional framework, in which individual projects or actions tended to be evaluated in isolation from their impacts elsewhere and in which water planners relied on the hydrology of the past to predict the future, is giving way to a new framework.

Lawyers will also benefit from developing the flexibility needed to adapt to future changes. Conventional legal structures and processes tend to promote conflict, and lawyers are trained to be adversarial. However, conventional legal methods and practices may have difficulty evolving fast enough to effectively address the challenges we face, due to the rapid pace and uncertainty of climate change. Lawyers can help their clients by relying more on another set of legal methods and skills geared toward consensual ways of resolving conflicts, focusing on cooperation and openness that can lead to success for all parties.

An example that illustrates the value of this evolution is a settlement in a case challenging the management of a stream in Northern California. Plaintiffs challenged the operation of a reservoir that provided benefits for urban water supply. However, the operation left part of the stream with no water in some dry years, to the detriment of fish species. After almost ten years of litigation, the parties developed a settlement agreement that allows for the continuation of most of the water supply operations but provides benefits to local fish, other wildlife species, and local landowners. The settlement agreement also provides educational, aesthetic, and recreational benefits to the local community.[3]

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www.resources.ca.gov/california_water_action_plan/docs/Final_California_Water_Action_Plan.pdf; *see also* PUB. POLICY INST. OF CAL., *supra* note 1.

[3] *See* 4 DEPT. OF WATER RES., *Summary of Significant Litigation 1998-2005, in* CALIFORNIA WATER PLAN UPDATE 2005, at 8 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-litigation-summaryofsignificantlitigation.pdf. The lawsuit, Putah Creek Council v. Solano Irrigation Dist., No. CV515766, was filed in 1990. *See* Peter B. Moyle, Michael P. Marchetti, Jean Baldrige & Thomas L. Taylor, *Fish Health and Diversity: Justifying Flows for a California Stream*, *in* 23 FISHERIES 6, 10 (1998). The trial judge ruled that additional instream flows were needed for Putah Creek downstream of the Solano Diversion Dam in 1996 and a Settlement Agreement was signed in 2000.

Fourteen years after signing the settlement agreement, the settlement appears to be working.[4] Instead of taking a winner-take-all "scorched earth" approach that could have prolonged the litigation for decades, the parties were able to negotiate a resolution that gave each of the interests they represented an outcome they could accept.

Over the last ten years, two separate water management planning efforts in California—integrated regional water management and climate change planning—have come together in a way that provides similar lessons to help different interests find common ground for water management solutions. This planning synthesis has resulted in a significant change in the way California now addresses issues of water management.

After a brief background discussion (Part II), Part III of this Article examines the history of the merger of these two initiatives. Part IV explores an approach for water management based on the experience gained from this history. This approach is built on consideration of three key elements: thinking holistically, expecting uncertainty, and encouraging cooperation. Part V describes an emerging framework through which participants can apply these elements in the management of water resources.

In a very short time, many of the ideas discussed in this Article have become an accepted way of thinking by those who participate in water management decisions. How they are applied is a continuing and emerging process. The subject of this Article is how these ideas can be combined and utilized to help us address the challenges of an evolving water management landscape.[5]

Karrigan S. Börk, Joseph F. Krovoza, Jacob V.Katz & Peter B. Moyle, *The Rebirth of California Fish & Game Code Section 5937: Water for Fish*, 45 U.C. DAVIS L. REV. 809, 869-72 (2012), *available at* lawreview.law.ucdavis.edu/issues/45/3/Topic/45-3_Bork.pdf; *see also* Joe Krovoza, *Our History*, PUTAH CREEK COUNCIL, www.putahcreekcouncil.org/history (last visited Apr. 27, 2014).

[4] Sara Tremayne, *Salmon Spawning in Putah Creek*, DAVIS ENTERPRISE, Dec. 13, 2013, at A1, *available at* www.davisenterprise.com/local-news/ag-environment/salmon-spawning-in-putah-creek/. The Putah Creek Council was formed after a prolonged drought that began in 1989. The water released from Putah Diversion Dam was inadequate to maintain flows in the creek beyond the first few miles downstream of the Putah Diversion Dam, and the streambed was littered with dead fish. Putah Creek Council rallied the community, including landowners, UC Davis and the cities of Winters and Davis, in an effort to bring water back to the creek, and established habitat restoration programs to improve the habitat that remained. As a result of measures agreed to in the settlement agreement and additional funding, salmon now return annually to the site.

[5] Although this approach is based on California's experience, the lessons learned can be used in water and land use planning processes incorporating climate change in the United States and elsewhere. Indeed, this approach may be applicable not only in the context of water and land use planning, but for any planning efforts that involve multiple parties and potentially competing interests.

II. BACKGROUND

A. CALIFORNIA—LAND OF EXTREMES

California's water management objectives include ensuring water supplies and water quality for multiple uses, managing floods, and protecting ecosystem functions and critical habitats.[6] With a population of over thirty-seven million[7] and a state gross domestic product of $2 trillion,[8] California is the equal of many large and prosperous nations in the world. It is characterized by diversity in cultures, ecosystems, and geography.[9]

California is also characterized by extreme variability of its water resources. It hosts vast deserts in the south and southeast parts of the state and redwood forests in the northwest. The city of Anza in the south has an annual average precipitation of less than three inches per year, while the Smith River in the north has an annual average precipitation of almost eighty-five inches.[10]

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[6] *Mission and Goals*, CAL. DEP'T OF WATER RESOURCES, www.water.ca.gov/about/mission.cfm (last modified Dec. 1, 2008).

[7] Hans Johnson, *Just the Facts: California's Population*, PUB. POLICY INST. OF CAL. (May 2011), www.ppic.org/main/publication_show.asp?i=259.

[8] CTR. FOR CONTINUING STUDY OF THE CAL. ECON., NUMBERS IN THE NEWS: CALIFORNIA POISED TO MOVE UP IN WORLD ECONOMY RANKINGS IN 2013 (July 2013), *available at* www.ccsce.com/PDF/Numbers-July-2013-CA-Economy-Rankings-2012.pdf.

[9] 1 CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2005: A FRAMEWORK FOR ACTION 2-1 (Dec. 2005) [hereinafter 1 CALIFORNIA WATER PLAN UPDATE 2005], *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol1/v1complete.pdf; *see also* 1 CAL. DEP'T OF WATERRES., CALIFORNIA WATER PLAN UPDATE 2009: INTEGRATED WATER MANAGEMENT 2-7 to 2-8 (Dec. 2009) [hereinafter 1 CALIFORNIA WATER PLAN UPDATE 2009], *available at* www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v1_all_cwp2009.pdf. For the most recent discussion of this subject, see *Planning for Stability Amid Extreme Diversity* and *Variability and Land Use and Development Patterns* 1 CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2013: INVESTING IN INNOVATION AND INFRASTRUCTURE, ch. 3 (forthcoming 2014) [hereinafter 1 CALIFORNIA WATER PLAN UPDATE 2013], *available at* www.waterplan.water.ca.gov/cwpu2013/prd/index.cfm. The *California Water Plan* is a comprehensive planning document produced by the Department of Water Resources (DWR), which evaluates water supplies and assesses agricultural, urban, and environmental water uses. The California Water Code requires DWR to update this plan every five years. *See* CAL. WATER CODE §§ 10004-10013 (Westlaw 2014). DWR also refers to the *California Water Plan* updates as the "Bulletin 160" series. Previous reports and Bulletins in the latter part of the twentieth century set the foundation for later reports. *See Previous Reports*, CAL. DEP'T OF WATER RES., www.waterplan.water.ca.gov/previous/index.cfm (last visited Apr. 28, 2014). For the history and legal requirements of the California Water Plan, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 1-2 to 1-3, 1-9 to 1-11. The 2005 California Water Plan Update changed the approach of the Plan to become a strategic plan that identified a roadmap for the future.

[10] *California Average Rainfall*, FIND THE BEST, average-

The state's ecosystem, agriculture, and urban users have varying needs for quality, quantity, timing of delivery, and place of water use. Precipitation, which is the primary source of California's water, varies from place to place, season to season, and year to year.[11] Most of the state's rain and snow fall in the north and eastern parts of the state during the winter. Most of the use of the water, however, is in the mid-state and southern valleys and the coast during the summer. In some years there is too much precipitation, resulting in massive flooding; in other years there is too little precipitation, resulting in drought conditions.[12]

B. HISTORICAL WATER POLICY PLANNING[13]

1. First There Were Water Projects

Toward the end of the nineteenth century and well into the twentieth century, California's water managers built extensive water supply and flood control systems in an effort to deal with the variability of the source and need for water resources. These included structures such as flood protection levees and water supply reservoirs and canals.[14]

California has, for the most part, considered water policy planning to be a local responsibility. There are more than a thousand local governmental units in California involved in water planning.[15] Cities and

rainfall.weatherdb.com/d/d/California (last visited Apr. 28, 2014); *see* 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-1 (describing the range of annual rainfall at more than 140 inches in the northwest to less than four inches in the southeast part of California).

[11] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-7.

[12] *Id.* at 4-5 to 4-7; *see also Planning for Stability Amid Extreme Diversity* and *Variability - Geophysical Variability,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 3, *supra* note *9*.

[13] *See generally* ELLEN HANAK ET AL., PUB. POLICY INST. OF CAL., MANAGING CALIFORNIA'S WATER: FROM CONFLICT TO RECONCILIATION 19-68 (2011), *available at* www.ppic.org/content/pubs/report/R_211EHR.pdf; *see also* Hundley Jr., N., *The Great Thirst: Californians and Water—A History* (2001).

[14] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-6; *see also* Water Educ. Found., *A California Water Chronology, in* 4 CALIFORNIA WATER PLAN UPDATE 2005, at 4-17 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-background-californiawaterchronology.pdf.

[15] REBECCA NELSON, UNCOMMON INNOVATION: DEVELOPMENTS IN GROUNDWATER MANAGEMENT PLANNING IN CALIFORNIA 6-7 (Woods Inst. For the Env't, Bill Lane Ctr. for the American West & Stanford Univ., Working Paper No. 1, Mar. 2011), *available at* woods.stanford.edu/sites/default/files/files/UncommonInnovation.pdf. Nelson notes that "California's Water Code provides for an astounding array of over 20 general types of local water agencies, which may be established anywhere in the State. On the ground, there are around 2300 of these agencies . . . . Such agencies include California water districts, county water districts, irrigation districts, reclamation districts, water conservation districts, water replenishment districts, water storage districts, and waterworks districts." *Id.* (citation and footnote omitted). 1 CALIFORNIA

counties have the primary authority to plan where and when urban and agricultural development will occur. Local government, including special water districts, also has the primary responsibility to develop the projects needed to provide the water for local growth. For example, San Francisco's water system includes the Hetch Hetchy reservoir near Yosemite and an underground tunnel that brings water to the city.[16] Each water system developed on its own, and there was little effort to look at water management on a statewide or regional basis or to look at the effects of the projects on other communities or resources.

In addition, state and federal governmental agencies built several large water management systems. These include the extensive system of levees and bypasses that protect land along the Sacramento and San Joaquin River Systems.[17] They also include the Federal Central Valley Project (CVP) and the State Water Project (SWP) that store water in reservoirs in the northern part of California and deliver water to agricultural and urban users throughout the state.[18]

All of these systems were built and operated based on historical hydrology as a guide to future operations. This means that water managers planned for the future based on past events. For example, water supply planners would look at the history of dry years and wet years and build projects designed to store and deliver water to get through the dry years. Flood management planners would look at the probability that a certain magnitude of flood would occur when planning the level of flood protection needed.[19]

WATER PLAN UPDATE 2005, *supra* note 9, at 3-7, 3-45; Kimia Mizany & April Manatt, *What's So Special About Special Districts? A Citizen's Guide to Special Districts in California, in* 4 CALIFORNIA WATER PLAN UPDATE 2005, at 4-55 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-background-whatssospecialaboutspecialdistricts.pdf; *Public Agencies, Districts, Local Governments, and Investor-owned Utilities,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 4, *supra* note 9.

[16] Brian E. Gray, *The Battle for Hetch Hetchy Goes to Congress*, 6 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 199 (2000). For a discussion of different regions of the state and their water resources management, see 3 CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2013: INVESTING IN INNOVATION AND INFRASTRUCTURE (forthcoming 2014).

[17] MARK W. COWIN ET AL., 2012 CENTRAL VALLEY FLOOD PROTECTION PLAN: A PATH FOR IMPROVING PUBLIC SAFETY, ENVIRONMENTAL STEWARDSHIP, AND LONG-TERM ECONOMIC STABILITY 1-2 to 1-7 (June 2012), *available at* wwwdwr.water.ca.gov/cvfmp/docs/2012%20CVFPP%20FINAL%20lowres.pdf.

[18] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-5 to 4-7. For more information on the State Water Project, see *California State Water Project Overview*, CAL. DEP'T OF WATER RES., wwwdwr.water.ca.gov/swp/ (last modified Aug. 11, 2010). For more information on the Central Valley Project, see *Central Valley Project*, U.S. DEP'T OF THE INTERIOR, www.usbr.gov/projects/Project.jsp?proj_Name=Central+Valley+Project (last modified Mar. 15, 2013).

[19] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-12, 4-32; 1 CALIFORNIA

Water planners and flood experts have always understood that previous water years could not predict what would happen in any specific year, but they thought that the historical record covered the full range of events that might occur over the long term. This idea that natural systems fluctuate within an unchanging envelope of variability is sometimes called "stationarity" and has been a foundational concept in water resource engineering.[20]

2. Environmental Concerns Restrict Water Projects

Since the 1800s, California's natural environment has experienced aquatic and riparian habitat degradation and declines in freshwater biodiversity.[21] Environmental protection actions, starting in the 1960s, had a major impact on California's water management. Books like Rachel Carson's *Silent Spring*[22] on the effects of pesticides and Paul Ehrlich's *The Population Bomb*[23] reflected a growing awareness about the environment. Concerns about environmental impacts led to a number of state and federal legislative and administrative regulatory actions to protect the environment, including protection of water and air resources and endangered species.[24]

These regulatory actions have significantly changed the way in which water projects are developed and operated. For example, state and federal water users have been prohibited from pumping water out of the Delta during times when fish species of concern were present.[25]

WATER PLAN UPDATE 2009, *supra* note 9, at 5-6 to 5-7.

[20] P.C.D. Milly et al., *Stationarity Is Dead: Whither Water Management?,* 319 SCIENCE 573, 573 (2008), *available at* wwwpaztcn.wr.usgs.gov/julio_pdf/milly_et_al.pdf.

[21] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-6 to 3-7.

[22] *See generally* RACHEL CARSON, SILENT SPRING (1962).

[23] *See generally* PAUL R. EHRLICH, THE POPULATION BOMB (1968).

[24] Two significant environmental laws reached their 40th anniversaries recently. The California Environmental Quality Act (CEQA) was enacted in 1971 and the federal Endangered Species Act was enacted in 1973. *See Water Allocation, Use and Regulation in California, in* 4 CALIFORNIA WATER PLAN UPDATE 2005, at 4-37 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-background-waterallocationuseregulation.pdf. For an overview of water management and governance in California, including environmental laws, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-38 to 3-46. For a discussion focused on institutional changes to protect the environment that affected water management, see CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 1993 (1993).

[25] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 4-36; *see* Dave Owen, *Law, Environmental Dynamism, Reliability: The Rise and Fall of CALFED*, LEWIS & CLARK L. SCH.'S ENVTL. L. ONLINE, www.elawreview.org/elaw/374/law_environmental_dynamism_rel.html (last visited Mar. 16 2014) (especially Section III on Creating the Tensions: Conventional Frameworks and California's Waters); *see also* Harrison C. Dunning, *Confronting the Environmental Legacy of*

Similarly, flood maintenance actions must operate within regulatory timeframes to protect endangered species.[26]

3. Bond Funds Provide Incentives To Manage Water More Efficiently

Later, beginning in the 1980s, local government was encouraged, through the use of bond funds, to look at some water management options that would provide alternatives to the use of large-scale water supply and flood management projects and to reduce the use of water through conservation. These programs were implemented because of a growing recognition that water resources were limited and needed more effective management. Grant and loan programs used subsidies to change local water management decisions in order to meet specific goals and policies established by the grant and loan programs. Funded programs included safe drinking water, water conservation, water recycling, and groundwater management. These programs were funded by proceeds from bond programs approved by California's voters and today amount to billions of dollars.[27]

4. California's Water Resources Are Strained

As recently as 1987, water planners were projecting that in most years, California's water resources would be sufficient to meet all its water needs for the foreseeable future.[28] Since the late 1990s, however, water planners began to recognize that California's water resources were finite and that the old management model of placing value primarily on water supply yield and extraction of water were no longer meeting California's needs.[29] Today, California is faced with competing demands

Irrigated Agriculture in the West: The Case of the Central Valley Project, 23 ENVTL. L. 943 (1993).

[26] CAL. DEP'T OF FISH & GAME & DEP'T OF WATER RES., STREAMBED ALTERATION AGREEMENT BETWEEN CALIFORNIA DEPARTMENT OF FISH AND GAME AND THE DIVISION OF FLOOD MANAGEMENT OF THE DEPARTMENT OF WATER RESOURCES FOR ROUTINE MAINTENANCE OF FLOOD CONTROL PROJECTS BY THE SACRAMENTO AND SUTTER MAINTENANCE YARDS 1-2 (Jan. 4, 2011), *available at* wwwdwr.water.ca.gov/floodmgmt/fmo/docs/2011_DFG_DFM_SAA_Routine_Maintenance.pdf.

[27] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-38. For a link to integrated regional water management grant programs, see *Integrated Regional Water Management Grants*, CAL. DEP'T OF WATER RES., www.water.ca.gov/irwm/grants/fundsource_legis.cfm (last modified Jan. 8, 2013). For a link to flood management grant programs, see *Flood SAFE California*, CAL. DEP'T OF WATER RES., www.water.ca.gov/floodsafe/grants/ (last modified June 20, 2013).

[28] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 1-3.

[29] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-23; *see also* ASS'N OF CAL. WATER AGENCIES, INVESTING IN ENVIRONMENTAL AND ECONOMIC SUSTAINABILITY (2009), *available at* www.acwa.com/sites/default/files/post/delta/2010/02/sustainability_principles.pdf.

for water for a growing population; for irrigation, to meet agricultural needs; and for flows and supplies, to meet fish and wildlife needs. The most recent assessment of California's water resources finds that:

> [d]espite significant physical improvements in water resource systems and in system management over the past few decades, we still face unacceptable risks from flooding, unreliable water supplies, continued depletion and degradation of groundwater resources, and habitat and species declines. Our interconnected system for using and managing water is extremely complex and subject to continually changing natural and human-made conditions. Moreover, our water resources provide critical support for the success of other dynamic systems: our ecosystems, social systems, and economic and market systems. Many of California's ecosystems and much of our water supply and flood protection infrastructure are no longer functioning or have exceeded their life cycles.[30]

C. INTEGRATED WATER MANAGEMENT AND CLIMATE CHANGE PLANNING PROVIDE NEW APPROACHES TO WATER RESOURCES PLANNING

Today, at a time when California's water resources are strained and future demands for water supply are expected to increase, managing these resources in a way that considers the effects of one action on another and maximizes the beneficial uses of water is critical. Climate change adds to the complexity of these efforts.[31]

Warmer temperatures and changes in precipitation patterns and runoff increasingly affect the ability to manage water resources.[32] Sea

[30] *A Call to Action,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 1, *supra* note 9. For a discussion of critical challenges regarding water management, see 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-29 to 4-44. For a discussion of deferred maintenance and aging facilities, and changes to consider when preparing for the future, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-13, 2-16, 3-14, 4-22 to 4-32.

[31] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-13 to 3-17, 4-32 to 4-36; Michael Kiparsky & Peter H. Gleick, Pacific Inst. for Studies in Dev., Env't and Sec., *Climate Change and California Water Resources: A Survey and Summary of the Literature, in* 4 CALIFORNIA WATER PLAN UPDATE 2005, at 4-545 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-globalclimate-climatechangeandcaliforniawater.pdf; 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-33 to 4-38; For additional information on this subject, see *IWM Funding and Expenditures: Climate Change,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 3, *supra* note 9.

[32] CAL. CLIMATE CHANGE CTR., OUR CHANGING CLIMATE: ASSESSING THE RISKS TO CALIFORNIA 1-4 (July 2006), *available at* www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF. This was the first of several assessments based on state-sponsored

levels are rising,[33] snowpack is decreasing, with runoff occurring earlier in the season,[34] and extreme heat events are increasing.[35] It is expected that fires will become more frequent and more severe as the temperature rises and precipitation decreases.[36] These changes will affect the ability to meet crucial water management objectives.

One of the California Department of Water Resources' (DWR) recent accomplishments has been to bring together two previously distinct water management planning efforts: (1) integrated regional water management and (2) climate change planning. This merger represents a significant change in the way water planners address issues of water management. As discussed earlier in this Part, planners used to rely primarily on the historical record and often planned their projects in isolation without considering the impact of their projects on other projects. Due to climate change, however, the hydrology of the past is a much less reliable indicator of future conditions. As one author has

peer-reviewed papers prepared pursuant to the California Energy Commission Public Interest Energy Research Program under the guidance of a Steering Committee of senior technical staff from State agencies and outside scientific experts, and research teams from the University of California system and other research groups. This first assessment covered the impacts of GHG emissions. *See also* DAN CAYAN ET AL., CAL. CLIMATE CHANGE CTR., SCENARIOS OF CLIMATE CHANGE IN CALIFORNIA: AN OVERVIEW 7-8 (2006), *available at* www.energy.ca.gov/2005publications/CEC-500-2005-186/CEC-500-2005-186-SF.PDF. The second assessment in 2009 determined that climate adaptation is an equally necessary response to climate impacts and complementary to GHG emissions reduction. *Second California Climate Change Assessment 2010*, CAL. CLIMATE CHANGE PORTAL, www.climatechange.ca.gov/climate_action_team/reports/second_assessment.html (last visited Apr. 26, 2014). The third assessment in 2012 focused on the extent and nature of the state's vulnerabilities to climate change and identifies opportunities for taking actions that can reduce the impacts of climate change. *Reports on the Third Assessment from the California Climate Change Center*, CAL. CLIMATE CHANGE PORTAL, www.climatechange.ca.gov/climate_action_team/reports/third_assessment/index.html (last visited Apr. 26, 2014.

[33] CAYAN ET AL., *supra* note 32, at 10-13; *see also* NAT'L RESEARCH COUNCIL, SEA LEVEL RISE FOR THE COASTS OF CALIFORNIA, OREGON AND WASHINGTON: PAST, PRESENT AND FUTURE (2012). Executive Order S-13-08 initiated the convening of the NRC research group. *See* Arnold Schwarzenegger, Executive Order No. S-13-08, OFFICE OF GOVERNOR (Nov. 14, 2008), gov.ca.gov/news.php?id=11036.

[34] CAYAN ET AL., *supra* note 32, at 13-14; *see also* Moetasim Ashfaq et al., *Near-Term Acceleration of Hydroclimatic Change in the Western U.S.*, 118 J. GEOPHYSICAL RES.: ATMOSPHERES 10676, 10676–93 (2013).

[35] CAL. CLIMATE CHANGE CTR., OUR CHANGING CLIMATE 2012: VULNERABILITY AND ADAPTATION TO THE INCREASING RISKS FROM CLIMATE CHANGE IN CALIFORNIA (2012) 2-3, *available at* www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf; *see also* OFFICE OF ENVTL. HEALTH HAZARD ASSESSMENT ET AL., INDICATORS OF CLIMATE CHANGE IN CALIFORNIA (Aug. 2013) 48-54, *available at* www.oehha.ca.gov/multimedia/epic/pdf/ClimateChangeIndicatorsReport2013.pdf.

[36] CAL. CLIMATE CHANGE CTR 2-3 AND 11-12., *supra* note 35; CAYAN ET AL., *supra* note 32, at 21-24.

stated, "stationarity is dead."[37]

As a result, there has been a greater emphasis within the last ten years on identifying the risks that climate change poses for water planning—both for supply and flood management—and identifying ways to manage such risks.[38] Planners today must manage the uncertainty caused by climate change by looking not only at the historical record, but also at projected changes in precipitation and temperature. In a time of growing uncertainty and scarcity they must also plan in an integrated manner that considers the relationships of a project to other projects and other elements of the environment in the region.[39]

The publication of the *Climate Change Handbook* in 2011, developed as a cooperative effort of DWR, the U.S. Environmental Protection Agency, the Resources Legacy Fund, and the U.S. Army Corps of Engineers, is the most recent effort to bring together these separate water planning efforts.[40] As highlighted by the *Climate Change Handbook*,

> [w]hile significant uncertainty still exists about how quickly and to what degree climate change will occur, a preponderance of the scientific evidence related to projected future climate changes compels planners to act now. It is therefore imperative that regional water planners begin to consider potential futures where temperatures have increased appreciably and precipitation patterns no longer follow the statistical distribution of past observations.[41]

[37] Milly et al., *supra* note 20, at 573.

[38] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9. For additional information on this subject, see *Recognizing and Planning for Risk and Uncertainty,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 5, *supra* note 9.

[39] BRIAN JOYCE ET AL., CAL. CLIMATE CHANGE CTR., CLIMATE CHANGE IMPACTS ON WATER FOR AGRICULTURE IN CALIFORNIA: A CASE STUDY IN THE SACRAMENTO VALLEY (Mar. 2006), *available at* www.energy.ca.gov/2005publications/CEC-500-2005-194/CEC-500-2005-194-SF.PDF; CAL. DEP'T OF WATER RES. ET AL., USING FUTURE CLIMATE PROJECTIONS TO SUPPORT WATER RESOURCES DECISION MAKING IN CALIFORNIA (Aug. 2009), *available at* www.energy.ca.gov/2009publications/CEC-500-2009-052/CEC-500-2009-052-F.PDF.

[40] U.S. ENVTL. PROT. AGENCY ET AL., CLIMATE CHANGE HANDBOOK FOR REGIONAL WATER PLANNING (Nov. 2011), *available at* www.water.ca.gov/climatechange/docs/Climate_Change_Handbook_Regional_Water_Planning.pdf. For a searchable database of climate change resources, see *Climate Change Handbook for Regional Water Planning*, CAL. DEP'T OF WATER RESOURCES, www.water.ca.gov/climatechange/CCHandbook.cfm (last modified May 16, 2013).

[41] U.S. ENVTL. PROT. AGENCY ET AL., *supra* note 40, at 1-4.

III. INTEGRATED REGIONAL WATER MANAGEMENT AND CLIMATE CHANGE PLANNING

A. CLIMATE CHANGE PLANNING

DWR has actively incorporated climate change into its planning activities in a number of ways. It has explored the water-energy relationship and greenhouse gas (GHG) emissions in the planning process, identified mitigation strategies to reduce GHG emissions for water supply projects, developed a department-wide GHG emissions reduction plan, identified impacts of climate change on water management planning processes, and identified adaptation strategies to help ameliorate the adverse impacts of climate change on water supply and water quality.[42] It has also established a statewide plan to guide, direct, and advise local and regional water planners.[43] It also encourages regional and watershed approaches to water planning.[44]

These climate change planning activities fall into two general categories: adaptation and mitigation. "Mitigation," in the context of climate change, is human intervention to reduce the sources of GHGs or to enhance sinks[45] that remove them from the atmosphere.[46] "Adaptation," in the context of climate change, means "adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."[47] The discussion of climate change planning activities in this Article focuses primarily on the effect of climate change on California's water management and adapting to it, rather than on mitigation.

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[42] *See Climate Change*, CAL. DEP'T OF WATER RESOURCES, wwwdwr.water.ca.gov/climatechange/ (last modified Apr. 4, 2014).

[43] *See California Water Plan*, CAL. DEP'T OF WATER RES., www.waterplan.water.ca.gov/ (last visited Apr. 26, 2014).

[44] *See Integrated Regional Water Management Grants*, CAL. DEP'T OF WATER RES., wwwdwr.water.ca.gov/irwm/grants/index.cfm (last modified Apr. 14, 2014).

[45] A "sink" is defined as vegetation that absorbs more carbon dioxide from the environment than it releases. *Carbon Sink*, DICTIONARY, dictionary.reference.com/browse/carbon sink (last visited Apr. 26, 2014); *see also Mitigation*, DICTIONARY, dictionary.reference.com/browse/mitigation?s=t (last visited Apr. 26, 2014).

[46] U.S. CLIMATE CHANGE SCIENCE PROGRAM, WEATHER AND CLIMATE EXTREMES IN A CHANGING CLIMATE—REGIONS OF FOCUS: NORTH AMERICA, HAWAII, CARIBBEAN, AND U.S. PACIFIC ISLANDS (June 2008) 134, *available at* www.ssec.wisc.edu/~kossin/articles/sap3-3-final-all.pdf.

[47] INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2001: SYNTHESIS REPORT (2001) 365; *see also* CAL. CLIMATE CHANGE CTR., *supra* note 35, at 3.

California has taken the lead nationally with a number of efforts to respond to climate change.[48] However, Executive Order S-3-05, issued June 1, 2005, stands out among them as a historic document.[49] It frames the issues of climate change adaptation and mitigation as they affect California and establishes a comprehensive approach to address climate change impacts. The Executive Order recognizes that "California is particularly vulnerable to the impacts of climate change" because of reduced snow pack, rising temperatures and rising sea levels.[50] The Order requires biennial reports on the impacts of climate change on California, and on mitigation and adaptation plans to combat these impacts.[51]

In the three years following the adoption of the Executive Order, DWR issued reports in three significant areas that set the foundation for current water management climate change planning in California. First, in its *California Water Plan Update 2005 (CWP Update 2005)*, DWR assessed the threats of climate change. The assessment was a landmark effort, and the first of its kind.[52] The *CWP Update 2005* also introduced for the first time policy recommendations regarding climate change planning and planning for an uncertain future. With regard to global climate change, it found that

> [t]he prospect of significant climate change warrants examination of how California's water infrastructure and natural systems can be managed to accommodate or adapt to these changes, and whether more needs to be done. . . . Incorporating flexibility and adaptability into our current system can strengthen our ability to respond to

[48] As early as 1988, the California Energy Commission was required to prepare and maintain an inventory of GHG emissions, study their effects and ways of avoiding or reducing emissions. Assem. B. 4420, 1988 Reg. Sess. (Cal. 1988). For a summary of laws, regulations and executive orders relating to climate change, see *California Climate Change Laws and Regulations*, CAL. CLIMATE CHANGE PORTAL, www.climatechange.ca.gov/state/mandates.html (last visited Apr. 26, 2014).

[49] Arnold Schwarzenegger, Executive Order No. S-3-05, OFFICE OF THE GOVERNOR (June 1, 2005), gov.ca.gov/news.php?id=1861. For a summary of the Order, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-32 to 3-33.

[50] Schwarzenegger, *supra* note 49.

[51] *Id*. at ¶ 4. In 2006, California passed the California Global Warming Solutions Act (also known as Assembly Bill (AB) 32, codified as CAL. HEALTH & SAFETY CODE §§ 38500-38599 (Westlaw 2014)). AB 32 adopted as law the 2020 GHG emissions reduction target, established in Executive Order S-3-05, of reducing California's GHG emissions to 1990 levels by 2020. AB 32 also identified the California Air Resources Board as the State agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

[52] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 4-32 to 4-36.

change.[53]

The *CWP Update 2005* did not get into details about ways of incorporating flexibility and adaptability. However, it found that

> managing water resources with climate change could prove different than managing for historical climate variability because climate change could produce hydrologic conditions, variability, and extremes that are different from what current water systems were designed to manage; may occur too rapidly to allow sufficient time and information to permit managers to respond appropriately; and may require special efforts or plans to protect against surprises or uncertainties.[54]

The *CWP Update 2005* recommended that DWR evaluate management responses to potential impacts of global climate change on the State Water Project and California's hydrology and work with climate change experts to develop alternative flow data to help state and regional planners test potential effects of global climate change on different management strategies.[55]

Second, in 2006, DWR issued a technical report entitled *Progress in Incorporating Climate Change into Management of California's Water Resources*.[56] The report described in detail the potential impacts of climate change on the operations of the State and federal water projects, the Delta, and flood management. This report, updated in 2009, documented DWR's first efforts to quantify and incorporate multiple climate change scenarios in its hydrology models in order to help decisionmakers evaluate how climate change could affect the reliability of California's water supply.[57] In 2010, DWR issued a related report entitled *Climate Change Characterization and Analysis in California Water Resources Planning Studies,* which provides a comprehensive and comparative look at thirteen planning studies by DWR and its partner

[53] *Id.* at 4-32.

[54] *Id.*

[55] *Id.* at 5-16.

[56] CAL. DEP'T OF WATER RES., PROGRESS ON INCORPORATING CLIMATE CHANGE INTO MANAGEMENT OF CALIFORNIA'S WATER RESOURCES (July 2006), *available at* wwwdwr.water.ca.gov/climatechange/docs/DWRClimateChangeJuly06.pdf#pagemode=bookmarks &page=1. For an update, see JAMIE ANDERSON ET AL., PROGRESS ON INCORPORATING CLIMATE CHANGE INTO MANAGEMENT OF CALIFORNIA'S WATER RESOURCES (Mar. 2008), *available at* wwwdwr.water.ca.gov/climatechange/docs/ClimaticChange_DWRarticle_Mar08.pdf.

[57] CAL. DEP'T OF WATER RES. ET AL., *supra* note 39; *see also* Jianzhong Wang et al., *Isolated and Integrated Effects of Sea Level Rise, Seasonal Runoff Shifts, and Annual Runoff Volume on California's Largest Water Supply*, 405 J. HYDROLOGY 83, 83-92 (July 2011).

agencies that have addressed climate change.[58] Since the publication of the report, DWR has established a Climate Change Technical Advisory Group.[59] One of the group's tasks is to provide recommendations to DWR on what kinds of climate change scenarios and hydrology models DWR should use in its planning studies.

Third, in 2008, DWR published *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*.[60] Like the *CWP Update 2005* and *Progress in Incorporating Climate Change into Management of California's Water Resources* discussed above, this report was the first of its kind. *Managing an Uncertain Future* focuses on the need for California's water managers to adapt to the impacts of climate change, some of which are already affecting our water supplies. The report noted that "[w]hile the exact conditions of future climate change remain uncertain, there is no doubt about the changes that have already happened."[61]

Building upon the work of the *CWP Update 2005, Managing an Uncertain Future* reaffirmed the conclusions of the *CWP Update 2005* that historic hydrologic patterns can no longer be solely relied upon to forecast the future. It also reaffirmed its conclusions that precipitation and runoff patterns are changing, thereby increasing the uncertainty for water supply and quality,[62] flood management, and ecosystem functions. It stated,

> [T]he hydrologic record cannot be used to predict expected increases in frequency and severity of extreme events such as floods and droughts. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted.[63]

Finally, *Managing an Uncertain Future* proposed a variety of

[58] CAL. DEP'T OF WATER RES., CLIMATE CHANGE CHARACTERIZATION AND ANALYSIS IN CALIFORNIA WATER RESOURCES PLANNING STUDIES (Dec. 2010), *available at* wwwdwr.water.ca.gov/climatechange/docs/DWR_CCCStudy_FinalReport_Dec23.pdf.

[59] *Climate Change Technical Advisory Group*, CAL. DEP'T OF WATER RESOURCES, wwwdwr.water.ca.gov/climatechange/cctag.cfm (last modified Apr. 18, 2014).

[60] CAL. DEP'T OF WATER RES., MANAGING AN UNCERTAIN FUTURE: CLIMATE CHANGE ADAPTATION STRATEGIES FOR CALIFORNIA'S WATER (Oct. 2008), *available at* wwwdwr.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf.

[61] *Id.* at 3.

[62] Although DWR has significant responsibility for water quality, primary responsibility for water quality planning comes under the jurisdiction of the State Water Resources Control Board and the Regional Water Quality Control Boards.

[63] CAL. DEP'T OF WATER RES., *supra* note 60, at 23.

adaptation strategies to address climate change impacts.[64]

The California Natural Resources Agency used the report as the primary basis for its discussion of water management adaptation strategies in its 2009 *California Climate Adaptation Strategy*.[65] In late 2013, the Agency issued a draft report updating the 2009 report. The new report, called *Safeguarding California,* augments previously identified strategies in light of advances in climate science and risk management options.[66]

B. INTEGRATED REGIONAL WATER MANAGEMENT PLANNING

At the same time that California was developing its responses to global climate change, the state was changing its approach to water management. In the early part of this century, more water planners began incorporating the concept of integrated water management planning into their thinking.

Integrated water management planning is an example of integrated resource planning, which began in the late 1980s in the electric power industry, as a comprehensive approach to resource management. When applied to water management, integrated resource planning is a

> systems approach that explores the cause-and-effect relationships affecting water resources wherever the planning entity's operations affect water use, quality, and supply. The process analyzes all the interrelated water management components in a given region. The focus is on the interrelation of the different water management components with the understanding that changes in the management of one component will affect the others. Because these components are often not confined to the boundaries of a single water management agency, a consensus-based, cross-jurisdictional, regional approach may be required to formulate comprehensive, win-win solutions to identified problems.[67]

Integrated water management at the regional level is a collaborative

[64] *Id.* at 8-29.

[65] CAL. NATURAL RES. AGENCY, 2009 CALIFORNIA CLIMATE ADAPTATION STRATEGY (2009), *available at* resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf. This Climate Adaptation Strategy was developed in response to Executive Order S-13-08. Schwarzenegger, *supra* note 33.

[66] CAL. NATURAL RES. AGENCY, SAFEGUARDING CALIFORNIA: REDUCING CLIMATE RISK—AN UPDATE TO THE 2009 CALIFORNIA CLIMATE ADAPTATION STRATEGY PUBLIC DRAFT 233 (Dec. 2013), *available at* resources.ca.gov/climate_adaptation/docs/Safeguarding_California_Public_Draft_Dec-10.pdf.

[67] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-8.

effort to manage all aspects of water resources in a region and to encourage formulation of comprehensive solutions to regional water resource issues. It includes a multitude of perspectives as diverse stakeholders engage one another.[68] It provides a way to address multiple resource objectives—water use efficiency, water quality protection, and environmental stewardship—and consider broad needs—economic growth, environmental quality, and social equity.[69] Moreover, if appropriately developed and implemented, regional water management planning—in combination with other regional planning efforts for transportation and land use—can serve as the basis for broader community plans for adapting to climate change.[70]

The concept of integrated *regional* water management planning is relatively new to water planning in California. Toward the end of the twentieth century, some areas of the state were considering watershed-wide evaluations of water supply needs and plans for meeting these needs.[71] However, a significant step occurred in 2002, when the legislature enacted the Integrated Regional Water Management Planning Act. This act encouraged local agencies to work cooperatively to manage local and imported water supplies and to establish integrated regional water management (IRWM) regions.[72]

The process of establishing an IRWM region is a voluntary one. Although establishing an IRWM region can be time-consuming, and members of the region may have to give up some of their autonomy, there are a number of reasons why entities may want to establish and join an IRWM region.

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[68] CAL. DEP'T OF WATER RES., INTEGRATED REGIONAL WATER MANAGEMENT (Sept. 1, 2011), *available at* wwwdwr.water.ca.gov/irwm/grants/docs/Brochures/IRWM6.Background_120306.pdf; *see also* WATER EDUC. FOUND., LAYPERSON'S GUIDE TO INTEGRATED REGIONAL WATER MANAGEMENT (2013).

[69] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-48.

[70] CAL. DEP'T OF WATER RES., *supra* note 60, at 11; 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-8.

[71] For example, see the Santa Ana Watershed Project Authority (SAWPA). In 1998, SAWPA developed a "Water Resources Plan to optimize the use of all water resources in the Santa Ana River watershed, integrate the watershed planning effort with Metropolitan Water District's Integrated Resources Plan Update, and provide descriptions of future projects within the Santa Ana River watershed." *OWOW Plan (IRWMP)*, SANTA ANA WATERSHED PROJECT AUTHORITY, www.sawpa.org/owow/the-plan/ (last visited Apr. 28, 2014). For other examples, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 3-27 to 3-29, and 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 4-48 to 4-52.

[72] S.B. 1672, 2001-2002 Reg. Sess. (Cal. 2002) (the IRWM Planning Act of 2002, adding Part 2.2 (commencing with section 10530, to Division 6 of the Water Code), *available at* www.leginfo.ca.gov/pub/01-02/bill/sen/sb_1651-1700/sb_1672_bill_20020921_chaptered.pdf.

As previously discussed, in the past, water management entities tended to work with a narrow focus on their service areas and primary functions, sometimes competing against efforts to resolve similar issues elsewhere or advancing duplicate efforts. An IRWM region can result in projects that achieve goals and objectives for several entities in a more cost-effective manner than separate entities acting on their own. It can help avoid duplication and wasteful competition.[73]

The IRWM grant program discussed later in this Part has contributed significantly to the establishment of IRWM regions because grants can be given only to IRWM regions approved by DWR. However, the real benefits of the IRWM process lie in the creation of new partnerships that present opportunities for reducing dependence on imported water and making better use of local supplies, utilizing groundwater in a way that gives more flexibility to limit groundwater overdraft, increasing water supply reliability and security, and improving water quality.[74]

DWR subsequently incorporated IRWM planning into the *CWP Update 2005*.[75] The *CWP Update 2005* was not only a significant milestone for California climate change planning, as discussed above, but also for California water management planning. With *CWP Update 2005*, DWR established an open and collaborative planning process to include elected officials, agencies, tribes, water and resource managers, businesses, academia, other stakeholders, and the public in developing findings and recommendations and making informed decisions for California's water future. As DWR's Director stated in the introduction:

> Update 2005 represents a fundamental transition in how we look at water resource management in California. It also represents a fundamental transition in the way state government needs to be involved with local entities and interest groups to deal with water issues in the state. The way we manage California's water resources is changing. We need to consider a broader range of resource management issues, competing water demands, new approaches to water supply reliability, and new ways of financing. Methods like storage and conveyance are being adapted to include more water conservation, recycling, desalination, and many other strategies.[76]

[73] CAL. DEP'T OF WATER RES., *supra* note 68.

[74] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-48.

[75] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-6 to 2-21, 3-26 to 3-30; see also *supra* Part V for more discussion of what constitutes a region.

[76] DEP'T OF WATER RES., CALIFORNIA WATER PLAN HIGHLIGHTS: A FRAMEWORK FOR

CWP Update 2009 and CWP Update 2013 continue the process that started with *CWP Update 2005* to produce a strategic water plan that meets California Water Code requirements, guides State investments in innovation and infrastructure, and advances integrated water management.[77]

Historically, like other water management planning efforts, bond programs providing grants and loans for water projects also focused on narrow areas or subjects such as water conservation or recycling.[78] But bond programs, too, have been evolving to embrace a more integrated approach. In 2002, the same year that the IRWM Planning Act was enacted, voters passed Proposition 50, which provided approximately $500 million in funding for competitive grants for projects that were consistent with an IRWM plan.[79] Proposition 50 provided monetary encouragement for local agencies to think collectively as a region with regard to water management planning, but it gave little guidance for IRWM planning or implementation.

In 2006, voters approved Proposition 84[80] and Proposition 1E,[81] which provide approximately $1.5 billion in funding for IRWM programs.[82] Propositions 84 and 1E, for the most part, have divided the water management grant and loan pie into two pieces: flood management and integrated regional water management.

ACTION (2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/cwphighlights/highlights.pdf.

[77] *See generally* 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9; 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9; 1 CALIFORNIA WATER PLAN UPDATE 2013, *supra* note 9. For more information on integrated regional water management planning, see 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-18 to 2-20, 4-47 to 4-52. For more recent information, see *Focus of Update 2013: Enhancing Regional and Statewide Integrated Water Management*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 2, *supra* note 9, and *IWM Funding and Expenditures: Local, State and Federal Expenditures 1995-2010*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 3, *supra* note 9 (noting that from 1995 to 2010, local agencies account for the largest portion of water-related expenditures, averaging $18 billion per year, followed by State agencies at $1.9 billion and federal agencies at $805 million per year).

[78] BILL JONES, SEC'Y OF STATE, VOTER INFORMATION GUIDE: MARCH 7, 2000 PRIMARY ELECTION 12-15 (2000) *available at* primary2000.sos.ca.gov/VoterGuide/pdf/13.pdf; *Proposition 204*, LEGIS. ANALYST'S OFF. (Nov. 1996), lao.ca.gov/ballot/1996/prop204_11_1996.html.

[79] BILL JONES, SEC'Y OF STATE, GENERAL ELECTION TUESDAY, NOVEMBER 5, 2002: OFFICIAL VOTER INFORMATION GUIDE 24-27 (Nov. 5, 2002), *available at* vote2002.sos.ca.gov/2002-vig/pdf/bp_pe01.pdf (codified as CAL. WATER CODE §§ 79560-79565 (Westlaw 2014)).

[80] BRUCE MCPHERSON, SEC'Y OF STATE, CALIFORNIA GENERAL ELECTION TUESDAY, NOVEMBER 7, 2006: VOTER INFORMATION GUIDE 138-45 (Nov. 7, 2006), *available at* vote2006.sos.ca.gov/voterguide/pdf/English.pdf.

[81] *Id*. at 125-27.

[82] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-59 to 4-62; *see also Integrated Regional Water Management Grants*, *supra* note 44.

C. THE UNION OF CLIMATE CHANGE AND INTEGRATED REGIONAL WATER MANAGEMENT PLANNING

For a number of years, DWR documents dealing with adaptation to climate change referred to IRWM planning as a strong tool for climate change planning. At the same time, DWR documents dealing with IRWM documents were encouraging regional plans to consider climate change as a critical issue. The reports, in conjunction with the adoption of the 2008 IRWM Planning Act, led to a unified planning approach that combines both IRWM and climate change planning.

The 2008 IRWM Planning Act gave this unification a significant boost when it repealed and replaced the 2002 IRWM Planning Act.[83] The 2008 Act strengthens the tie between IRWM plans and planning regions and bond funding. It also specifically requires IRWM plans to include consideration of all of the resource management strategies identified in the California Water Plan, as updated by DWR, and an evaluation of the adaptability to climate change of water management systems in the region.[84]

The 2008 Act requires that an IRWM region be established before IRWM grant funds can be given for projects in the region. The Act does not specify how a region is to be defined but leaves it up to local entities to establish regions, which must then be approved by DWR.[85]

Since IRWM regions are voluntary associations, they can be formed in different ways. A region is, at a minimum, a geographic area encompassing the service areas of multiple local agencies. They can be defined by geographic regions such as watersheds or hydrologic regions.[86] "However, an IRWM region is not based solely on geographic considerations or characteristics. It is also defined by water management issues, its stakeholders, and water-related conflicts [and] must be designed or configured to diversify and strengthen the regional water

[83] S.B. 1, 2007-2008 2nd Ex. Sess. (Cal. 2008), *available at* www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0001-0050/sbx2_1_bill_20080930_chaptered.pdf.

[84] CAL. WATER CODE § 10541(e)(1), (10) (Westlaw 2014).

[85] CAL. WATER CODE § 10541(f) (Westlaw 2014). A region must follow the Regional Acceptance Process to become eligible to apply for grants under Propositions 84 and 1E. Proposition 1E is found in Appendix F of the 2012 Guidelines. *See* CAL. DEP'T OF WATER RES. ET AL., INTEGRATED REGIONAL WATER MANAGEMENT PROPOSITION 84 AND 1E—GUIDELINES app. F (Nov. 2012), *available at* wwwdwr.water.ca.gov/irwm/grants/docs/Guidelines/GL_2012_FINAL.pdf.

[86] CAL. PUB. RES. CODE § 75026(b)(1) (Westlaw 2014). DWR divides California into ten hydrologic regions corresponding to the state's major water drainage basins. *See* 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 4-7 to 4-9, 4-48.

management portfolio."[87]

The ways in which an IRWM region is governed and makes decisions can vary. The 2008 Act states that a regional water management group must include at least three local agencies, with at least two having statutory authority over water supply or water management. Participation can be governed by a joint powers agreement, a memorandum of understanding, or other written agreement approved by the governing bodies of those local agencies.[88]

As of 2011, IRWM regions covered over eighty-seven percent of the state and included approximately ninety-nine percent of the population. In some instances, a hydrologic region is covered by a single IRWM planning entity. In other hydrologic regions there are multiple IRWM planning regions. Some IRWM regions cross hydrologic boundaries. The largest IRWM planning region is approximately 12.5 million acres, and the smallest is about 170,000 acres.[89]

DWR also provided further impetus for IRWM planning with the publication of *Managing an Uncertain Future*. This report, discussed above in the context of climate change, emphasized the importance of IRWM as a vehicle for implementing climate change adaptation strategies. The adaptation strategies identified in the report included (1) providing a continuous and sustainable source of funding for IRWM planning, and (2) full development of the potential for IRWM planning to address the effects of climate change.[90]

The report made further suggestions for how regional IRWM plans should incorporate climate change adaptation, such as identifying how local groundwater storage and banking can be coordinated with local surface water storage, assessing how vulnerable a region is to increased flood or drought risks, identifying aggressive conservation and efficiency strategies, encouraging low-impact development land use policies that reduce water demand and stormwater runoff, and planning for sharing of water supplies and infrastructure during emergencies such as droughts.[91]

DWR went a step further in 2010 when it issued its *2010 IRWM Grant Program Guidelines* for Proposition 84 and related Proposition 1E

[87] CAL. DEP'T OF WATER RES. ET AL., *supra* note 85, at 77.

[88] The Integrated Regional Water Management (IRWM) website provides a link to all the accepted regions of 2009 and 2011. Different examples of agreements can be found by looking at different regions. For examples, see *IRWM Archives, Integrated Regional Water Management Grants*, CAL. DEP'T OF WATER RES., wwwdwr.water.ca.gov/irwm/grants/archive.cfm#RAP (last modified Apr. 14, 2014).

[89] CAL. DEP'T OF WATER RES., *supra* note 68.

[90] CAL. DEP'T OF WATER RES., *supra* note 60, at 10-12.

[91] *Id.* at 12.

funding.[92] Proposition 84 provides a clear statement that climate change poses significant challenges that must be addressed through careful planning and improvements in land use and water management that reduce contributions to global warming and that improve adaptability.[93] The *2010 Guidelines* expanded the scope of climate change issues that need to be addressed in IRWM Plans. For the first time GHG emissions mitigation and climate change adaptation were added as required elements of planning and project selection.[94]

The *2010 Guidelines* required that IRWM plans include a discussion of the potential effects of climate change on the IRWM region, including an assessment of the IRWM region's vulnerabilities to the effects of climate change and potential adaptation responses to reduce those vulnerabilities. In addition, they require grantees to have adopted a process that discloses and considers GHG emissions when choosing between project alternatives.[95] The *2010 Guidelines* also provided an Appendix with additional detail to help IRWM regions develop or revise IRWM plans, including information regarding the legislative and policy context for these climate change requirements, guidance on assessing mitigation and adaptation options, and a list of references that can provide further assistance.[96]

California's approach to water management and climate change planning has been recognized nationally as leading the way in addressing climate change threats.[97] In 2011, DWR and the Environmental Protection Agency, in partnership with the Army Corps of Engineers and the Resources Legacy Fund, published the *Climate Change Handbook*.[98] The *Climate Change Handbook* built upon California's experience as the basis for its analysis.

The *Handbook* provides guidance for water planners on how to consider climate change issues in an IRWM process at a national level. It

[92] CAL. DEP'T OF WATER RES. ET AL., *supra* note 85.

[93] CAL. PUB. RES. CODE § 75003.5 (Westlaw 2014), added by Prop. 84, effective Nov. 8, 2006, *available at* repository.uchastings.edu/cgi/viewcontent.cgi?article=2251&context=ca_ballot_props.

[94] CAL. DEP'T OF WATER RES. ET AL., *supra* note 85.

[95] *Id.* at 24.

[96] *Id.* at 36, app. C.

[97] AMERICAN RIVERS & NATURAL RES. DEFENSE COUNCIL, GETTING CLIMATE SMART: A WATER PREPAREDNESS GUIDE FOR STATE ACTION (2013*), available at* www.nrdc.org/water/climate-smart/; *Ready or Not: How Water-Ready Is Your State or City?*, NAT. RESOURCES DEF. COUNCIL, www.nrdc.org/water/readiness/ (last visited Apr. 26, 2014); *see also* Andrea Ward, *California Leads States in Climate Change Adaptation*, GREENSOURCE (Jan. 19, 2010), greensource.construction.com/news/2010/100119Climate-Change-Adaptation.asp.

[98] U.S. ENVTL. PROT. AGENCY ET AL., *supra* note 40.

outlines quantitative tools and techniques to address climate change adaptation and GHG emissions mitigation, offers guidelines for assessing the vulnerability of a watershed or region to climate change impacts, and presents case studies in which the latest methodologies have been applied in a water planning context.

Coming full circle, the *2012 IRWM Grant Program Guidelin*es now require analysis of vulnerabilities that, at a minimum, are equivalent to the vulnerability analysis in the *Handbook*. Under these guidelines, IRWM plans must now include a list of prioritized vulnerabilities based on the vulnerability assessment and a plan, program, or methodology for further data gathering and analysis of the prioritized vulnerabilities.[99]

Although IRWM and climate change planning efforts began independently, their current union is not at all surprising. Different regions will be impacted differently by climate change, necessitating regionally specific solutions. The need to mitigate and adapt to climate change also affects almost all water planning efforts. IRWM is a process that is ideally suited to consider that need in relationship to other factors.

As the *Climate Change Handbook* recognizes,

> Integrated regional water planning is an excellent framework for addressing water-related climate impacts, as it provides a process for stakeholders with varied water-related priorities to work together to develop solutions that satisfy all water uses and needs. Because climate change impacts so many aspects of water resources, this process is ideal for addressing adaptation to climate change and for developing measures to help mitigate future climate change.[100]

IRWM and the guidance described in the *Climate Change Handbook* provide water managers with information they can use to adapt to changes in the climate.[101] A similar approach for all planning sectors can be found in the *California Adaptation Planning Guide* produced by the California Emergency Management Agency and the Natural Resources Agency.[102] Most recently, regional self-reliance and integrated water management were included as basic principles in the recently adopted *2014 California Water Action Plan*.[103]

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[99] CAL. DEP'T OF WATER RES. ET AL., *supra* note 85, at 23.

[100] U.S. ENVTL. PROT. AGENCY ET AL., *supra* note 40, at 1-1.

[101] *Id.*

[102] CAL. EMERGENCY MGMT. AGENCY & CAL. NATURAL RES. AGENCY, CALIFORNIA ADAPTATION PLANNING GUIDE: PLANNING FOR ADAPTIVE COMMUNITIES (July 2012), *available at* resources.ca.gov/climate_adaptation/docs/01APG_Planning_for_Adaptive_Communities.pdf.

[103] CAL. NATURAL RES. AGENCY, *supra* note 2.

D. LEGAL CHALLENGES REGARDING IRWM PLANNING AND CLIMATE CHANGE ADAPTATION

1. Water Management Planning

As discussed above, the IRWM Planning Act of 2008 and Proposition 84 set forth legal requirements that local and regional entities must comply with if they want to apply for grants to fund water management planning and implementation. To date, there have been no cases challenging the grant program. Aside from these acts, there is no legal requirement that local water management entities plan or act in an integrated fashion.

2. The California Environmental Quality Act

Several lawsuits have raised the question whether, under the California Environmental Quality Act (CEQA), the lead agency adequately considered climate change. In 2010, the California Natural Resources Agency updated the regulations that implement CEQA (called the CEQA Guidelines)[104] to address GHG emissions specifically, as required by Senate Bill 97.[105]

Senate Bill 97 was, in part, a response to comments from the California Attorney General's office on CEQA documents that public agencies were not considering the impacts of increased GHG emissions.[106] The 2010 CEQA Guidelines amendments make it clear that a project's GHG emissions, and the contribution of those emissions to the problem of global climate change, are an impact that must be included in CEQA environmental review documents—and that feasible mitigation must be provided for any significant adverse GHG emissions impacts.[107]

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[104] CAL. ENVTL. QUALITY ACT, CAL. PUB. RES. CODE §§ 21000-21177 (Westlaw 2014); CEQA GUIDELINES, CAL. CODE REGS., tit. 14, §§ 15000-15387 (Westlaw 2014).

[105] S.B. 97, 2007 LEG. SESS. (Cal. 2008) (adding CAL. PUB. RES. CODE § 21083.05), *available at* www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0051-0100/sb_97_bill_20070824_chaptered.pdf.

[106] *See* S. Rules Comm., S.B. 97 Bill Analysis (2007), *available at* www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0051-0100/sb_97_cfa_20070822_142622_sen_floor.html.

[107] CAL. NATURAL RES. AGENCY, ADOPTED AND TRANSMITTED TEXT OF S.B. 97 GUIDELINES AMENDMENTS (Dec. 30, 2009), *available at* ceres.ca.gov/ceqa/docs/Adopted_and_Transmitted_Text_of_SB97_CEQA_Guidelines_Amendments.pdf (the 2010 Guidelines thus directly discuss the issue of mitigation for GHG emissions). For a definition of mitigation, see *Mitigation, supra* note 45.

While the 2010 CEQA Guidelines directly addressed a project's impact on climate change, they did not directly address the question whether CEQA requires consideration of the effect of climate change on the project. However, in a response to a request to include such a requirement in the 2010 CEQA Guidelines, the Natural Resources Agency declined to include such a requirement, saying that the existing CEQA Guidelines already required such a consideration.[108]

There are several cases on whether CEQA requires an analysis of the impact of climate change on a project.[109] *Ballona Wetlands Land Trust v. City of Los Angeles* is the most recent in a line of cases that have held that the effects of the environment on a project do not need to be analyzed in an Environmental Impact Report (EIR).[110] The Second District Court of Appeal, in *Ballona*, held that CEQA did not require an EIR to analyze the rise in sea level caused by climate change and its impacts to the eventual users of the project. The court found that to the extent that the CEQA Guidelines required lead agencies to consider the effect of the environment on the project, the Guidelines exceeded statutory authority under CEQA.[111]

Whether the *Ballona* case correctly interpreted CEQA was raised in a case currently before the California Supreme Court, *CBI v. BAAQMD*.[112] The air district in that case argued that *Ballona,* and the line of cases it relied on, was wrong. In *CBI v. BAAQMD*, the air district had established thresholds of significance that included, among other things, criteria that were based on the impact of the environment on future residents or users of a proposed project. One of the plaintiffs challenged the air district's promulgation of a threshold of significance, arguing that the air district did not have the authority to require the review of such impacts under CEQA. The First District Court of Appeal discussed the argument, but decided that it did not need to address the issue since the threshold of significance was not invalid on its face. The California Supreme Court has granted review on this issue.[113]

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[108] *See* CAL. NATURAL RES. AGENCY, FINAL STATEMENT OF REASONS 101-03 (CAL. 2009), *available at* ceres.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf.

[109] There have been a number of lawsuits on the effect of a project on climate change (e.g., increased GHG emissions) and the need to consider such effects under CEQA, which will not be discussed in this Article.

[110] Ballona Wetlands Land Trust v. City of L.A., 134 Cal. Rptr. 3d 194 (Ct. App. 2011).

[111] *Id.* at 206-08.

[112] Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist., 161 Cal. Rptr. 3d 128, 147-48 (Ct. App. 2013), *review granted,* 312 P. 3d 1070 (Cal. 2013).

[113] Cal. Bldg. Indus. Ass'n v. Bay Area Air Quality Mgmt. Dist., 312 P. 3d 1070 (Cal. 2013) ("The petition for review is granted. The issue to be briefed and argued is limited to the following: Under what circumstances, if any, does the California Environmental Quality Act require an analysis

What do these cases mean for project proponents and their lawyers? The Court will resolve the issue of whether CEQA requires an analysis of how existing environmental conditions will impact future residents or users of a proposed project. Until the issue is resolved, for cases going before the Second District Court of Appeal, the answer is that CEQA does not require an analysis of impacts of the environment on a project. For cases before other Courts of Appeal, the answer is less clear. To the extent they have not yet ruled on the question, the *Ballona* case can be considered persuasive, but it is not binding.[114]

The *CBI v. BAAQMD* case also raises the question whether an agency can require applicants for permits to consider the impacts of climate change on their projects in a context outside of CEQA. The answer may depend, in part, on other agency authorities. For example, as discussed above, DWR requires applicants for IRWM funding to consider the effect of climate change on their projects. The requirement does not arise from CEQA, but from other legal requirements in the 2008 IRWM Planning Act and Proposition 84.

Another question not raised in either of the cases is whether an agency can choose to examine the impacts of the environment on a project it is proposing to carry out. DWR is currently examining the impacts of climate change on the project analyzed in the Bay Delta Conservation Plan.[115] It is doing so, in part, because in order to be incorporated into the Delta Stewardship Council's Delta Plan, the Delta Reform Act requires the analysis of possible sea level rise, changes in precipitation, and runoff patterns on the activities considered in the EIR.[116] However, even without such a requirement, it seems reasonable to assume that a lead agency has the discretion to conduct an analysis of climate change as part of a "future condition" in a cumulative impacts analysis, as climate change is reasonably foreseeable.[117]

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of how existing environmental conditions will impact future residents or users (receptors) of a proposed project?" (citation omitted)).

[114] *See* S. Orange Cnty. Wastewater Auth. v. City of Dana Point, 127 Cal. Rptr. 3d 636 (Ct. App. 2011); *see also* Baird v. Cnty of Contra Costa, 38 Cal. Rptr. 2d 93 (Ct. App. 1995).

[115] U.S. DEP'T OF INTERIOR ET AL., PUBLIC DRAFT ENVTL. IMPACT REPORT (EIR)/ENVTL. IMPACT STATEMENT (EIS): BAY DELTA CONSERVATION PLAN 29-1 (Nov. 2013), *available at* baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_EIR-EIS_Chapter_29_-_Climate_Change.sflb.ashx.

[116] CAL. WATER CODE § 85320(b)(2)(C) (Westlaw 2014) ("The potential effects of climate change, possible sea level rise up to 55 inches [140 centimeters], and possible changes in total precipitation and runoff patterns on the conveyance alternatives and habitat restoration activities considered in the [EIR].").

[117] *See* CAL. WATER CODE §§ 225-238 (Westlaw 2014), to support the analysis if it is consistent with reasonable water management planning practices—an area within DWR's statutory authority.

IV. LESSONS LEARNED—A DIFFERENT WATER MANAGEMENT APPROACH FOR THE FUTURE

The *Climate Change Handbook* uses DWR's IRWM planning framework to provide water resource planners with the means "to integrate climate change considerations into decisions and planning processes, today and in years to come."[118] The *Handbook* brings together information from both the IRWM and climate change planning spheres and offers an innovative way of incorporating climate change considerations into a regional planning process.

This process provides an approach for all participants, including lawyers, who are involved with water management issues to plan for a more sustainable and resilient future.[119]

> Sustainable development and water use, and environmental stewardship foster a strong economy, protect public health and the environment, and enhance our quality of life. Sustainable development relies on the full consideration of social, economic, and environmental issues in policy- and decision-making. Sustainable water use ensures that we develop and manage our water and related resources in a way that meets present needs while protecting our environment and assures our ability to meet the needs of the future.[120]

Resiliency means the ability to recover from or adjust easily to change.[121] Given the uncertainties and risks with regard to water

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[118] U.S. ENVTL. PROT. AGENCY ET AL., *supra* note 40, at 1-1.

[119] *Approach Definition*, MERRIAM-WEBSTER, www.merriam-webster.com/dictionary/approach (last visited Apr. 23, 2014) (defining "approach" as "a way of dealing with something: a way of doing or thinking about something").

[120] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-10. For more discussion of sustainable water development, see 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-23 to 2-24 and 5-16 to 5-20, and *Recognizing and Planning for Risk and Uncertainty,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 5, *supra* note 9. *See also* Joseph W. Dellapenna*, Is Sustainable Development a Serviceable Legal Standard in the Management of Water?,* 127 WATER RES. UPDATE 87 (Feb. 2004), *available at* ucowr.org/files/Achieved_Journal_Issues/v127Is%20Sutainable%20Delvelopment%20a%20Serviceable%20Legal%20Standard%20in%20the%20Management%20of%20Water.pdf. Dellapenna notes that while sustainable use of water is a clear and enforceable standard, sustainable development requires the exercise of judgment as factors such as the needs of the present generation, of ecosystems, and of future generations are balanced against each other and that sustainable development requires a process of analysis and decisionmaking, rather than a strict legal standard for resource use. *Id.* at 91.

[121] *Resilient Definition,* MERRIAM-WEBSTER, www.merriam-webster.com/dictionary/resilient (defining "resilience" to mean "improve the capacity of resources and natural systems to return to prior conditions after disturbance") (last visited Apr. 23, 2014); *see also* 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 3-17.

resources, this approach provides a better way to manage ecosystems and water supply and flood protection programs than other approaches have provided in the past.[122]

This Part explores this approach, based on the experience gained from studying the synthesis of the two water planning initiatives discussed in Part III. The approach is built on three key elements: (1) think holistically, (2) expect uncertainty, and (3) reduce conflict. Part V describes an emerging framework through which participants can apply these elements in the management of water resources.

A. THINK HOLISTICALLY

The word "holistic" comes from the Greek word *holos*, meaning "all, whole, entire, or total."[123] It refers to the idea that all of a given system cannot be determined or explained by the sum of its component parts viewed in isolation. Instead, the system as a whole determines how the parts behave. For example, the *Climate Change Handbook* recommends that when evaluating projects, planners should not only look at each project separately, but they should also look collectively at all the projects being considered.

> [T]he planner may integrate some of the selected projects to achieve synergies and increase cost-effectiveness. Integration can alter individual project characterizations so that portfolio performance is not simply a combination of individual project performances; and the portfolio of projects included in the IRWMP may have benefits that are not equal to the sum of benefits of the individual projects in the plan.[124]

1. Be Comprehensive

Participants in decisionmaking should think about how the actions

[122] *See* 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-23.

[123] *Holism*, NEW WORLD ENCYCLOPEDIA, www.newworldencyclopedia.org/entry/Holism (last visited Apr. 21, 2014).

[124] U.S. ENVTL. PROT. AGENCY ET AL., *supra* note 40, at 6-1 to 6-2. As another example, the conflict between the rich and poor nations regarding GHG emissions reductions might be decreased if rich nations could receive credit for funding renewable energy projects in poor nations, instead of asking the poor nations to reduce their GHG emissions. Carol J. Williams, *Rich-vs.-Poor Nations' Clash Stalls Work Toward 2015 Climate Pact,* L.A. TIMES, Nov. 23, 2013, www.latimes.com/world/worldnow/la-fg-wn-climate-debate-rich-poor-nations-20131122,0,2259183.story#axzz2tnLLZiu3.

they contemplate will interact with each other and with existing and proposed projects and actions.[125] Successful planning considers all competing needs and takes into account social, environmental, and economic impacts.[126]

The solution to a problem may mean rethinking the problem in a holistic way. For example, instead of building a new dam, an upstream watershed can serve as a natural storage infrastructure that serves multiple purposes. A number of watershed programs in California serve as illustrations. They are designed to protect upstream watersheds from fires and deforestation in order to prevent the GHG emissions that would result from fires and to maintain better water quality, water supply, and wildlife protection.[127]

2. Include a Strategic Plan

Strategic plans are high level plans to achieve one or more goals under conditions of uncertainty. Strategy is important, because the resources to achieve these goals are usually limited.[128] The goals of a strategic plan should address multiple resource objectives such as protection from floods, maintaining or restoring good water quality, or providing for a reliable water supply. The strategic plan should include a broad range of options, from local management actions such as water conservation, recycling, and groundwater use, to more effective use of state and regional infrastructure.[129] The *California Water Plan* is California's strategic plan for managing and developing California's water resources.[130]

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[125] Jianguo Wu, *Landscape Ecology, Cross-Disciplinarity, and Sustainability Science,* 21 LANDSCAPE ECOLOGY 1, 3 (Jan. 2006).

[126] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-24; *see also Focus of Update 2013: Enhancing Regional and Statewide Integrated Water Management*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 2, *supra* note 9.

[127] 2 CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN UPDATE 2009: INTEGRATED WATER MANAGEMENT 27-1 to 27-12 (Dec. 2009) [hereinafter 2 CALIFORNIA WATER PLAN UPDATE 2009], *available at* www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v2_all_cwp2009.pdf.

[128] *Definitions for Strategy*, DEFINITIONS, www.definitions.net/definition/Strategy (last visited Apr. 26, 2014).

[129] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 1-1 to 1-8 and 2-1 to 2-6; *see* 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 2-10 to 2-16.

[130] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 1-8 (describing the 2005 California Water Plan Update as follows: "The first update of the 21st century, A Framework for Action represented a fundamental shift in how people look at water resources management. It recognized the need to work cooperatively and to approach water management in a comprehensive, integrated way. It was the product of a collaborative process that brought together the Department of Water Resources with an advisory committee representing urban, agricultural, and environmental

Costs of developing or maintaining infrastructure (including green infrastructure such as wetlands, riparian habitat, and watershed systems) should include long-term operation and maintenance costs. For example, costs calculated for new levees should include the costs of long-term maintenance or rebuilding of the levee so they can be compared to green infrastructure such as floodway bypasses, which might not need as much maintenance.[131] Considering these costs, sometimes called "life-cycle" costs, helps provide a more valid comparison of proposed alternatives.[132]

In the past, projects may have been selected for funding because they were more easily implemented, were more consistent with priorities of a particular funding source, or were at the front of the queue when money became available. Today, factors such as readiness and funding compatibility can be considered, but they should not drive the process.[133] Funding and administrative actions should be linked to strategic objectives that help meet priorities of the strategic plan.[134]

interests. For the first time, the state's water plan included a strategic plan, including actions for meeting the challenges of sustainable water uses and reliable water supplies in the face of an uncertain future."). Chapter 1 of the 2005, 2009, and 2013 California Water Plan Update is called *The Strategic Plan*.

[131] *Envision Sustainable Infrastructure Rating System*, INST. FOR SUSTAINABLE INFRASTRUCTURE, sustainableinfrastructure.org/rating/index.cfm (last visited Apr. 28, 2014). The Envision™ Sustainable Infrastructure Rating System is the product of a joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure (ISI). ISI is a nonprofit organization comprising the American Public Works Association, the American Society of Civil Engineers and the American Council of Engineering Companies. Both ISI and the Zofnass Program were the principals in developing the rating system. Their final product, Envision™, is a web-based tool that provides a holistic framework for evaluating and rating the various social or community benefits, environmental benefits, and economic benefits of all types and sizes of infrastructure projects. Its function is to evaluate, grade, and give formal recognition to infrastructure projects that are more sustainable over the course of the project's life cycle. COWIN ET AL., *supra* note 17, at 1-2 to 1-7, 2-4. For a discussion of the Central Valley Flood Protection Program, including the "no-regrets" policy, see *id.*

[132] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 6-8.

[133] *Themes for Update 2013: Investment in Innovation and Infrastructure,* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 1, *supra* note 9; *Finance Planning Framework*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 7, *supra* note 9.

[134] For example, Wells Fargo and the National Fish & Wildlife Foundation launched a financial assistance program called Environmental Solutions for Communities, whose mission is to help communities create a more sustainable future by supporting projects that link economic development and community well-being to the stewardship and health of the environment. Launched in 2012, this five-year initiative is supported through a $15 million contribution from Wells Fargo that will be used to leverage other public and private investments with an expected total impact of over $37.5 million. *Environmental Solutions for Communities*, NAT'L FISH & WILDLIFE FOUND., www.nfwf.org/environmentalsolutions/Pages/home.aspx (last visited Apr. 26, 2014).

3. Develop Good Data

Planning holistically works best when supported by an accurate, shared, and system-based understanding of the resources involved. Data production, data management, and analytical tools are critical to developing these understandings.[135] An example of a coordinated and collaborative process used to develop information on climate change is the establishment of the California Climate Change Center in 2006. It established priorities for research and has produced a number of peer-reviewed papers that offer significant insight into the effect of climate change on California's different economic and social sectors.[136]

4. Spend Wisely on Innovation

The forthcoming *CWP Update 2013* distinguishes innovation from infrastructure and describes innovation as a broad range of activities that comprises governance, planning and process improvements, data, tools, and water technology research and development.[137] An example of how innovation can work is the Rural Urban Connection Strategy developed by the Sacramento Area Council of Government (SACOG). This strategy has gathered data on land use in the SACOG area and developed a number of analytic tools designed to show what happens to SACOG's rural assets when different development or infrastructure changes are made.[138] These innovation activities may have significant up-front costs. However, strategic use of innovation can establish priorities to help choose and design projects in a way that saves money later.[139]

Decisionmakers may be reluctant to spend money for "planning,"

[135] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-21 to 2-2-4, 4-1 to 4-7; 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 6-1 to 6-30; *see also Integrated Data and Analysis*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 6, *supra* note 9.

[136] See *supra* note 32 for sources of the three Climate Change Assessments produced. These reports summarize the results of a series of peer-reviewed papers prepared under the guidance of a Steering Committee of senior technical staff from State agencies and outside scientific experts, and research teams from the University of California system and other research groups. The California Water Plan is another example. *See supra* note 9.

[137] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-12 to 2-23; *see also Themes for Update 2013:Investment in Innovation and Infrastructure*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 1, *supra* note 9.

[138] SACRAMENTO AREA COUNCIL OF GOV'TS, RURAL-URBAN CONNECTIONS STRATEGY (May 2011), *available at* www.sacog.org/rucs/pdf/RUCS%20Booklet%202011%20Web.pdf; SACRAMENTO AREA COUNCIL OF GOV'TS, RURAL-URBAN CONNECTIONS STRATEGY: TOOLS AND INNOVATIONS, *available at* www.sacog.org/rucs/pdf/RUCS%20Tools.pdf.

[139] *See supra* note 9.

because they want to see immediate action and results.[140] The *CWP Update 2013*, however, has made strategic investment in innovation a priority.[141] An example of a program that recognizes the need for innovation is Proposition 84. It includes significant funds for developing and improving IRWM plans and for planning and monitoring.[142] In 2011, $21 million out of $226 million was awarded for planning purposes.[143]

5. Use the Human Environment

Redesigning human-made habitats so that their use by humans is compatible with use by a broad array of other species can result in social, economic, and environmental benefits.[144] Agricultural activities can often co-exist with, and even provide benefits for, ecosystem protection and enhancement programs.[145] Agricultural lands also provide a unique opportunity to look at previously unrecognized ecosystem services such

[140] Some of the funds for programs funded by Proposition 204 and Proposition 50 did not include funding for planning or feasibility studies. 1996 Proposition 204, *available at* vote96.sos.ca.gov/; and 2000 Proposition 13, *available at* primary2000.sos.ca.gov/VoterGuide/pdf/13.pdf; *see* CAL. WATER CODE §§ 79560-79565 (Westlaw 2014).

[141] *See supra* note 9.

[142] BRUCE MCPHERSON, SEC'Y OF STATE, CALIFORNIA GENERAL ELECTION—TUESDAY, NOVEMBER 7, 2006—VOTER INFORMATION GUIDE 138-45 (2006), *available at* vote2006.sos.ca.gov/voterguide/pdf/prop84_text.pdf. Proposition 84 allows up to five percent of the bond funds to be spent for development, updating, or improvement of the IRWM plans, and up to ten percent of the funds to be used for planning and monitoring necessary for the successful design, selection, and implementation of projects authorized under the program. *See* CAL. WATER CODE §§ 75026(c), 75072 (Westlaw 2014). Grants can also be for planning or implementation.

[143] ESTHER CONRAD, U.C. BERKLEY DEP'T OF ENVTL. SCIENCE, POLICY AND MGMT., CLIMATE CHANGE AND INTEGRATED REGIONAL WATER MANAGEMENT IN CALIFORNIA: A PRELIMINARY ASSESSMENT OF REGIONAL APPROACHES (June 2012), *available at* www.water.ca.gov/climatechange/docs/IRWM_CCReport_Final_June2012_EConrad_UCBerkeley.pdf.

[144] *See* J. Green*, Novel Ecosystems Not So Novel Anymor*e, THE DIRT: UNITING THE BUILT AND NATURAL ENVIRONMENTS (Oct. 16, 2013), dirt.asla.org/2013/10/16/novel-ecosystems-not-so-novel-anymore/; *see also* Michael L. Rosenzweig, *Reconciliation Ecology and the Future of Species Diversity*, 37 ORYX 194 (Apr. 2003), *available at* eebweb.arizona.edu/courses/ecol302/lectures/oryxrosenzweig.pdf; MICHAEL L. ROSENZWEIG, WIN-WIN ECOLOGY: HOW THE EARTH'S SPECIES CAN SURVIVE IN THE MIDST OF HUMAN ENTERPRISE (2003).

[145] *CalTrout Study Turns Idle Rice Fields into Salmon Nursery: Could Hold the Key to Central Valley Salmon Restoration*, CAL. TROUT (Mar. 12, 2013), caltrout.org/tag/yolo-bypass; *see also* LAURENCE D. FORD ET AL., MANAGING RANGELANDS TO BENEFIT RED-LEGGED FROGS & CALIFORNIA TIGER SALAMANDERS (Sept. 2013), *available at* www.rangelandconservation.com/Documents/ManagingRangelandsCRLF_CTS.pdf. For numerous case studies, see *Ecosystem Services Database*, CAL. DEP'T OF FOOD & AGRIC., apps.cdfa.ca.gov/EcosystemServices/ (last visited Apr. 26, 2014).

as carbon sequestration, wildlife habitat, water quality and other uses. California's Department of Food and Agriculture has developed an ecosystem services qualitative assessment model that can help identify the values of these services.[146] Cap-and-trade programs and eco-system markets are being developed that would pay landowners to manage their land in a way that rewards those values.[147]

B. PLAN FOR UNCERTAINTY

Decisionmakers must look at scenarios that consider uncertainty. They need to be flexible and be able to adapt. They need to look at outcomes or benefits to be achieved in the long term, instead of focusing only on specific projects to be built.

1. Focus on Outcomes

Sometimes decisionmakers confuse the project with the purpose of or need for the project. For example, when deciding whether to build dams or levees, it is important to think about what makes these projects desirable. The reason is that they are believed to help achieve desired outcomes or benefits, such as improvement of water supply reliability or reduction of the potential for loss of life and property from floods.[148]

Once the purpose is framed in terms of the desired benefit, rather than simply the construction of the project, participants in decisionmaking can look at other options, including whether some projects can help meet additional outcomes with more flexibility to meet uncertainty.[149] They can consider options such as including changes that serve other purposes or replacing a single high-impact project with a number of small low-impact projects.[150] They can also think in terms of

[146] *Ecosystem Services Qualitative Assessment*, CAL. DEP'T OF FOOD & AGRIC., www.cdfa.ca.gov/EnvironmentalStewardship/qamodel.html (last visited Apr. 26, 2014).

[147] *See, e.g., DU's Carbon Sequestration Program*, DUCKS UNLIMITED, www.ducksunlimited.org/conservation/ecoassets/carbon-sequestration-program (last visited Apr. 26, 2014).

[148] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-3. The 2005 California Water Plan lays the foundation for an outcome-based approach, but the 2013 California Water Plan Update makes it a foundational principle. *See Themes for Update 2013: Integrated Water Management*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 1, *supra* note 9; *see also* 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 2, *supra* note 9 (box 2-3 and related text).

[149] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 5-32.

[150] Many smaller projects can provide more flexibility in meeting objectives. They may not always work, but the results of failure are not as disastrous as when reliance is placed in a larger project. Mr. Sagarin from the University of Arizona says nature's mechanisms (as illustrated by the octopus) for dealing with risk are fairly simple. They are decentralized, they have redundant parts,

reducing the need for projects.[151]

2. *Understand that the Future Is Uncertain*

The uncertainty of climate change should not be an obstacle to action. However, it does require decisionmakers to plan with risk in mind.[152] Human beings should not stick their heads in the sand hoping that the climate change problem will go away.[153] Instead, they should take measures to deal with that risk.[154]

Scholars argue that "stationarity" is dead not only with regard to water management, but also with regard to preservation of the environment.[155] Absolute protection or restoration, as contemplated by some of our major environmental legislative achievements, may not be possible in the face of climate change. There is good evidence that some species will become extinct regardless of what humans try to do to save them.[156] Regulators may need to look for alternatives that are more flexible than the current regulatory approach, but that still provide a desirable outcome in terms of species preservation and diversity.[157]

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they form highly symbiotic networks, and they build on success. Douglas Fischer, *Dealing with Climate Change? Think Like An Octopus* (Oct. 31, 2013), www.dailyclimate.org/tdc-newsroom/2013/10/octopus-solution.

[151] *See About OWOW,* SANTA ANITA WATERSHED PROJECT AUTH. (last visited Apr. 21, 2014), www.sawpa.org/owow/about-owow/. The Santa Anita Watershed Project Authority began thinking along integrated regional water management lines as far back as 2002 and is now in the second version of One Water One Watershed, which includes a number of innovative actions including a water demand reduction program.

[152] JAMES PAINTER, CLIMATE CHANGE IN THE MEDIA: REPORTING RISK AND UNCERTAINTY (2013).

[153] Lord Deben, *Human Beings Are Not Ostriches, We Insure*, GLOBE INT'L (Mar. 4, 2013), www.globeinternational.org/index.php/news/blog/item/human-beings-are-not-ostriches-we-insure.

[154] Communicating risk is more effective if it is done in a way that reduces fear. Meredith T. Niles et al., *Perceptions and Responses to Climate Policy Risks Among California Farmers*, 23 GLOBAL ENVTL. CHANGE 1752 (Jan. 2013).

[155] Milly et al., *supra* note 20, at 573; *see* Robin Kundis Craig, "*Stationarity Is Dead"—Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 9 (2010); *see also* Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 WASH. U. J.L. & POL'Y 175 (2010).

[156] Larry R. Brown et al., *Implications for Future Survival of Delta Smelt from Four Climate Change Scenarios for the Sacramento-San Joaquin Delta, California,* 36 ESTUARIES & COASTS 754 (July 2013); Peter B. Moyle et al., *Climate Change Vulnerability of Native and Alien Freshwater Fishes of California: A Systematic Assessment Approach,* 8 PLOS ONE 1 (May 2013), *available at* www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0063883&representation=PDF ("[T]he results of our assessment show that 82% of native fish species were in our two highest categories (critically or highly vulnerable to climate change)."); *see also* Green, *supra* note 143.

[157] Holly Doremus, *Adapting to Climate Change with Law that Bends Without Breaking*, 2 SAN DIEGO J. CLIMATE & ENERGY L. 45 (2010), *available at*

3. Use Good Tools To Manage Uncertainty

As we move forward, we will need to consider not only a variety of climate change possibilities, but different futures based on paths that include different estimates of factors such as population increases, levels of urban and industrial development, and agricultural patterns. Taking different possible scenarios into account provides the ability to see and consider these potential paths.[158]

Adaptive management can help "manage" uncertainty. This "requires careful science-based planning followed by measurement to determine whether a given action actually achieves intended goals. If goals are not achieved, informed adjustments can be made" to the action to better achieve intended goals.[159] One of the best discussions of the relationship between good science and adaptive management is found in the Delta Stewardship Council's Delta Plan adopted in 2013.[160]

4. Recognize That Some Natural Processes Can Provide Adaptability

For over a century now, California has relied on a system of human-made concrete structures for flood protection, water supply, and water quality. Many of these structures are beginning to reach the end of their natural lives and will need significant investments to repair and maintain.[161] As we move forward to replace these structures, it makes

scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1706&context=facpubs*; see also* Alejandro E. Camacho et al., *Perspectives: Reassessing Conservation Goals in a Changing Climate*, ISSUES IN SCIENCE AND TECHNOLOGY (2010). For more on this subject and on reconciliation ecology in the context of California water management, see HANAK ET AL., *supra* note 13.

[158] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 1-5. Chapter 4 in Volume 1 of the 2005 California Water Plan Update lays the foundation for scenario-based planning. The 2009 and 2013 Updates build upon this foundation*. See* CAYAN ET AL., *supra* note 32; *see also* Dr. Mark C. Trexler, *The Conundrums of Business Adaptation to Climate Change: Why and How Much*?, CSR WIRE (Oct. 21, 2013), www.csrwire.com/blog/posts/1068-the-conundrums-of-business-adaptation-to-climate-change-why-and-how-much.

[159] DELTA STEWARDSHIP COUNCIL, THE DELTA PLAN 37 (2013), *available at* deltacouncil.ca.gov/sites/default/files/documents/files/DeltaPlan_2013_CHAPTERS_COMBINED.pdf.

[160] *Id.* at 34. The Delta Stewardship Council has very active Independent Science Board, and the Council's Science Program has developed a Delta Science Plan to provide direction for using science to inform policy and management decisions in the Delta. *Delta Science Plan*, DELTA STEWARDSHIP COUNCIL, deltacouncil.ca.gov/science-program/delta-science-plan (last visited Apr. 26, 2014).

[161] *See supra* note 30, for sources analyzing aging systems and challenges facing today's water managers. For additional information, including studies showing a need in California for over $44 billion to fix aging drinking water systems and more than $50 billion for flood management projects, see *Key Facts and Findings: Demand for Funding*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 7, *supra* note 9. As concrete channels inevitably age and reach the end of their design

sense to make use of natural processes where they provide more adaptability and to work with, rather than against, natural processes. The inclusion of ecosystem restoration in a project usually requires a degree of return to more natural patterns of erosion, sedimentation, flooding, and stream flow that can make it harder for catastrophic natural processes to disrupt such projects and also make them easier and less costly to maintain.[162] For example, instead of building houses next to the oceans and rivers, and building higher and stronger facilities to hold back floods, it makes sense to preserve or re-establish the ability of the floodplains to help control and dissipate floods.[163]

Taking advantage of natural processes can also help meet other goals or outcomes. Protecting ground water basins from subsidence and contamination provides natural storage systems that can be used to collect and deliver flood waters.[164] Other natural processes help in cleaning or preventing contamination of water.[165]

C. ENCOURAGE COOPERATION

When all parties get together to really talk and listen, the possibility of conflict is reduced, and mutually acceptable solutions can be found.[166]

lives, river managers confront the question of what to do with this deteriorating infrastructure. *See The Future of the Concrete Channel Conference*, LANDSCAPE ARCHITECTURE & ENVTL. PLAN., U.C. BERKELEY (2013), *available at* laep.ced.berkeley.edu/next100years/events/the-future-of-the-concrete-channel/.

[162] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 4-32.

[163] COWIN ET AL., *supra* note 17, at 2-1 to 3-43.

[164] 2 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 127, at 8-1.

[165] NATURAL RES. DEFENSE COUNCIL, AFTER THE STORM: HOW GREEN INFRASTRUCTURE CAN EFFECTIVELY MANAGE STORMWATER RUNOFF FROM ROADS AND HIGHWAYS (Sept. 2011), *available at* www.nrdc.org/water/files/afterthestorm.pdf; *see also* 2 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 127, at 22-8.

[166] 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 1-1 to 1-4. The 2005 California Water Plan Update describes the new public process it used in developing the Update as one of the significant accomplishments of this water plan. The principles of a fair, open, and transparent process should serve as the cornerstone for future updates because they (1) considerably expand public involvement and access to the State's water planning process; (2) seek collaborative recommendations that are stronger, have greater longevity, and are more likely to be adopted by the Governor's Office, Legislature, State, federal, and local agencies and governments, and resource managers; and (3) produce a strategic plan with a vision, mission, goals, recommendations, and implementation plan. *Id.* at 1-4; *see also* 1 CALIFORNIA WATER PLAN UPDATE 2009, *supra* note 9, at 1-10 to 1-14; *Process Guide: California Water Plan Update, in* 4 CALIFORNIA WATER PLAN UPDATE 2009 (Dec. 2009), *available at* www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v4c01a02_cwp2009.pdf.

1. Be Cross-Cutting and Collaborative

Decisionmakers are finding that when they include all or a significant number of interested participants in the planning and decisionmaking process, they are often more successful.[167] Collaborative multi-party involvement can lead to multi-purpose objectives and solutions and more efficient use of scarce funds. The more interests that view a project or program as benefiting them, the more likely it is that decisionmakers will find support for funding and implementation.[168]

2. Provide Open, Early and Transparent Communication

Open communication eliminates the concern of those outside the planning process that decisions are being made behind closed doors without public input. It is difficult to overcome fear and hostility toward a project once project opponents believe it is being planned behind their backs.[169] Even though it may add time and cost to a planning process, open communication may ultimately be more efficient in accomplishing the planning objective.[170] To be effective, open communication must be

[167] Multiparty involvement includes federal and state regulatory and planning agencies, regional government, academia, and economic, social and environmental interests. *See* Ariel Ambruster, *Collaborative vs. Technocratic Policymaking: California's Statewide Water Plan*, *in* 4 CALIFORNIA WATER PLAN UPDATE 2009 (Jan. 2008), *available at* www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v4c17a02_cwp2009.pdf.

[168] *See OWOW Plan (IRWMP),* SANTA ANA WATERSHED PROJECT AUTHORITY, www.sawpa.org/owow/the-plan/ (last visited Apr, 26, 2014). At the international level, see U.N. FOOD & AGRIC. ORG., TACKLING CLIMATE CHANGE THROUGH LIVESTOCK: A GLOBAL ASSESSMENT OF EMISSIONS AND MITIGATION OPPORTUNITIES (2013), *available at* www.fao.org/docrep/018/i3437e/i3437e.pdf. The proposed actions would reduce emissions and increase production. Critical to achieving success is involvement of all sectors of society involved.

[169] Under DWR's Water Contract Extension Program, contract negotiations are conducted in public. *Water Supply Contract Extension Program*, CAL. DEP'T OF WATER RES., wwwdwr.water.ca.gov/swpao/watercontractextension/ (last modified Mar. 3, 2014). These public negotiations were required as part of a Settlement Agreement challenging an early contract negotiation that was not conducted in public. *See* CAL. DEP'T OF WATER RES., PRINCIPLES REGARDING PUBLIC PARTICIPATION PROCESS IN STATE WATER PROJECT CONTRACT NEGOTIATIONS (July 3, 2003), *available at* wwwdwr.water.ca.gov/swpao/docs/notices/03-10.pdf; *see also* CAL. DEP'T OF WATER RES., GUIDELINES FOR REVIEW OF PROPOSED PERMANENT TRANSFERS OF STATE WATER PROJECT ANNUAL TABLE A AMOUNTS (July 3, 2003), *available at* wwwdwr.water.ca.gov/swpao/docs/notices/03-09.pdf.

[170] Environmental disclosure laws, such as CEQA and the National Environmental Policy Act, require a draft environmental document be made available to the public prior to an agency making a decision to go forward on a project. The Bay Delta Conservation Plan proponents made two administrative draft environmental documents available to the public in the spring of 2012 and the spring of 2013 before issuing the formal draft document in December 2013. *See Public Review,* BAY DELTA CONSERVATION PLAN, baydeltaconservationplan.com/Home.aspx (last visited Apr. 28, 2014).

a two-way street. Decisionmakers need to give information to interested parties and they must be willing to listen with an open mind to suggestions from others.[171]

There are exciting new tools that open up opportunities to the public to get involved in the planning process. For example, the *California Water Plan* is working on establishing a Planning Information Exchange platform. Interested parties will be able to add information to the project's database and suggest different ways to manipulate it.[172]

Transparency means making the decisionmaking process more accessible to participants. This means using tools such as public websites where people can access information and provide input.[173] However, different parties have different levels of understanding and interest. While the public wants more information, the amount of information can sometimes be overwhelming. In order for open communication to be effective, it must be understandable to those receiving the communication. Transparent communication benefits from efforts to summarize and highlight information.[174]

Communicating early and often gives participants an opportunity to be more involved in decisionmaking. There are advantages to having a project somewhat defined before asking for input, particularly when regulatory agencies must approve the project. However, early communication allows other interests to get involved sooner and communicate their knowledge and concerns to project decisionmakers

[171] NELSON, *supra* note 15, at 17-19. Nelson notes that "[u]ndeniably, broad stakeholder involvement takes time. Some [Ground Water Management Programs] that cover large areas report up to 6 years of consensus-building and negotiation with tens of stakeholder groups. However, broad stakeholder involvement brings multiple perspectives to help meet multiple objectives, and can help avoid conflicts that have derailed past groundwater management efforts, which were otherwise promising." *Id.* at 17 (citations omitted).

[172] 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 6-15 to 6-20. The Desert Renewable Energy Habitat Plan is planning on using a new and open electronic platform that gives all interested parties a chance to see and work with all the data that is available to the project proponent. CAL. NATURAL RES. AGENCY, STAFF MEETING NOTICE DESERT RENEWABLE ENERGY CONSERVATION PLAN (DRECP) (Oct. 28, 2013), *available at* www.drecp.org/meetings/2013-10-18_meeting/2013-10-18_staff_meeting.pdf.

[173] *See Climate Change Science*, CALIFORNIA CLIMATE CHANGE PORTAL, www.climatechange.ca.gov/research/ (last visited Apr. 26, 2014); *Cal-Adapt*, CAL. ENERGY COMM'N, cal-adapt.org/ (last visited Apr. 26, 2014)*; see also* CONRAD, *supra* note 143, at 46 (identifying Cal-Adapt as a useful tool for Integrated Regional Water Management regions).

[174] *See Public Review*, *supra* note 170. Public Review for the Bay Delta Conservation Plan includes massive amounts of information, such as two administrative drafts of the Plan and the Environmental Impact Report/Statement. *See* U.S. DEP'T OF INTERIOR ET AL., *supra* note 115. Program staff are constantly revising and reworking the website to try to make it more accessible and more understandable to members of the public, including those very knowledgeable and those just beginning to try to understand the plan.

early in the process. This allows project decisionmakers to make changes early on to incorporate new information or respond to negative concerns. Keeping these interests involved throughout the decisionmaking process can also provide valuable feedback.

Good participation in decisionmaking can involve considerable cost and time. The *CWP Update 2009* involved 32,185 person-hours over twenty-three months and 149 meetings.[175] Getting input from participants other than the decisionmaker may be improved by funding key participants.[176]

3. Use Incentives

Often when participants in decisionmaking think of solving problems, they think in the context of "sticks" and look for answers in restrictive or prescriptive legislative and administrative regulatory requirements and penalties.[177] For example, the Delta Stewardship Council requires water suppliers to show that they are carrying out measures to reduce dependence on the Sacramento-San Joaquin Delta in order to demonstrate compliance with the Council's regulatory plan.[178] A number of recent recommendations to improve water management have looked at additional efforts to mandate or penalize specific activities. These recommendations include mandatory reporting, best practices, or other required behavior, as solutions to better water management planning.[179] Regulatory controls have been a critical tool in achieving

[175] *Process Guide, supra* note 166. "Comparing the *Update 2005* and *Update 2009* venues for collaboration and corresponding person-hours conveys the complexity and efficiency of the revised design. Essentially, *Update 2009* conducted 138% of the *Update 2005* collaboration, in terms of person-hours, in 38% of the time, with 24% fewer meetings (compare the 32,185 person-hours over 23 months and 149 meetings of *Update 2009* with the 23,252 person-hours over 60 months and 197 meetings of *Update 2005*)." *Id.* at 3.

[176] DEP'T OF WATER RES., EMERGING INVESTMENT STRATEGIES FOR THE FUTURE OF IRWM (2014), *available at* www.water.ca.gov/irwm/stratplan/documents/IRWMFuture.pdf; ESTHER CONRAD, U.C. BERKLEY DEP'T OF ENVTL. SCI., POLICY & MGMT., REGIONAL GOVERNANCE OF FLOOD MANAGEMENT IN THE CENTRAL VALLEY: AN ANALYSIS OF THE INTEGRATED REGIONAL WATER MANAGEMENT AND REGIONAL FLOOD MANAGEMENT PLANNING (forthcoming 2014) (pointing out that additional state funding can support on-going dialogue, as well as encouraging greater coordination, among different interests and to support stakeholder engagement efforts); *see also* Susan B. Flohr, Comment, *Funding Participation in Agency Proceedings*, 27 AM. U. L. REV. 981 (1978).

[177] Doremus, *supra* note 157.

[178] CAL. CODE REGS. tit 23, § 5003 (Westlaw 2014).

[179] *See* UNIV. OF CAL. BERKELEY, LEGAL ANALYSIS OF BARRIERS TO ADAPTATION FOR CALIFORNIA'S WATER SECTOR (July 2012), *available at* www.energy.ca.gov/2012publications/CEC-500-2012-019/CEC-500-2012-019.pdf; LEGIS. ANALYST'S OFFICE, LIQUID ASSETS: IMPROVING MANAGEMENT OF THE STATE'S GROUNDWATER

social and environmental goals and will continue to play an important role in the future.

However, policy goals, paired with incentives that provide assistance to make the transitions and change desired by policymakers, can be a powerful combination. Use of incentives or "carrots" can help garner widespread support for and participation in implementing policy. Participants are more likely to have a personal investment in successful results.[180]

There are many different kinds of incentives. Finding the right ones will depend on the problem to be solved. In recent testimony before Congress, suggestions were made for a number of incentives to encourage climate change response actions. Some of these have been around for a long time. They include providing tax credits and giving federal funds to communities. Others are not so familiar. They include reforming the National Flood Insurance Program to reflect extreme weather and climate risk in its rates, incorporating climate and extreme weather risk into building standards, purchasing or relocating properties near coastal or river areas at repeat risk and transferring development rights from coastal and river properties to areas inland, and using disaster assistance to encourage actions that would avoid similar disasters in the future.[181]

Financing incentives can be a challenge.[182] In today's current fiscal environment, legislators may be reluctant to pay for things such as buying out properties in flood-prone areas or paying for tax breaks or incentives to encourage certain kinds of behavior. To gain support for new incentives, legislators will need to be shown that the benefits of the incentives outweigh the costs. For example, evidence that the costs of

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RESOURCES (Mar. 24, 2010), *available at* www.lao.ca.gov/reports/2010/rsrc/groundwater/groundwater_032410.pdf; LEGIS. ANALYST'S OFFICE, IMPROVING MANAGEMENT OF THE STATE'S GROUNDWATER RESOURCES (Feb. 1, 2011), www.lao.ca.gov/handouts/resources/2011/Improving_Management_of_Groundwater_Resources_020111.pdf.

[180] NELSON, *supra* note 15; *see also* Niles et al., *supra* note 154, at 7.

[181] *Climate Change: It's Happening Now: Before U.S. S. Comm. on Env't & Pub. Works*, 113th Cong. 1 (July 18, 2013) (statement of Franklin W. Nutter, President, Reinsurance Association of America), *available at* www.epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=f86b767e-7a71-48b4-8eef-7bd9ad1d3884.

[182] HANAK ET AL., *supra* note 13, at 343-47; *see also* ELLEN HANAK ET AL., PUB. POLICY INST. OF CAL., PAYING FOR WATER IN CALIFORNIA (2014), *available at* www.ppic.org/content/pubs/report/R_314EHR.pdf. For a general discussion of funding water management programs, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, 2-19 to 2-21, and *IWM Funding and Expenditures*, 1 CALIFORNIA WATER PLAN UPDATE 2013, ch. 3, *supra* note 9.

reacting to disasters may be greater than the cost of incentives to avoid disaster might encourage legislators to provide funding for programs that reduce the risks of disaster. Creative ways of building in costs, such as with the proposal to reform the flood insurance program or to change building standards, deal with the cost issue by internalizing costs. Incentives can also be self-funded, such as when a region or industry raises funds through a tax or fee to encourage specific projects that benefit the whole region or group.[183]

Another barrier to using incentives could involve reluctance on the part of some people to take advantage of them because of fear that regulatory agencies might use the information to mandate specific behaviors. For example, farmers might be concerned about taking advantage of programs that might provide free or low-cost water efficiency data, because they are concerned that regulatory agencies might try to use this information to mandate specific water management practices.[184] However, a study of farmers in Northern California found that, even though negative policy perceptions about past experience with regulatory governmental programs strongly influences their concerns for future policies, these negative perceptions do not reduce their interest in participating in government programs if there are economic benefits that make it worth participating.[185]

V. THE OLD FRAMEWORK IS GIVING WAY TO A NEW ONE; HOW WILL IT FUNCTION, AND WHAT CAN WE DO TO ADAPT AND SUCCEED UNDER THE NEW FRAMEWORK?

A. THINGS ARE CHANGING

The water management landscape is changing. Under the old framework, evaluation of individual projects or actions tended to be in isolation from their impacts elsewhere, and long-term records of average rates and timing of precipitation were used to predict the future. This

[183] For a discussion of a fee on retail water bills, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-21. For an overview of different financing mechanisms, including innovative structures, see David Kracman, *Financing Strategies and Guidelines for Funding Water Resources Projects*, *in* 4 CALIFORNIA WATER PLAN UPDATE 2005 (Dec. 2005), *available at* www.waterplan.water.ca.gov/docs/cwpu2005/vol4/vol4-planning-financingstrategies.pdf.

[184] Similarly, farmers might be unwilling to carry out wildlife-friendly projects that would increase populations of endangered species, because they are concerned that increased populations and regulatory agency awareness of their property could lead to regulatory restrictions on how they operate their farms.

[185] Niles et al., *supra* note 154, at 7.

framework is giving way to a new framework based on a more collaborative and holistic approach to addressing water management and climate change planning that takes into account some level of uncertainty. As water policy managers and legislatures perceive the emerging framework to be more successful than previous practice, it should be expected that laws and the regulations that implement them will continue to embrace this modern view more and more.

This emerging framework is built, in part, on recognition of the desirability of a regionally based way of making decisions. Eventually, in the face of growing legal and regulatory acceptance of this approach, efforts to defend parochial interests without regard to the consequences at a regional level will become less effective and will eventually become counter-productive. Successful participants, including lawyers and their clients, will understand that this transformation is under way and will adapt to it.

B. THE EMERGING FRAMEWORK

In Part IV, this Article discussed an approach that encourages and helps different interests find common ground for water management solutions. This approach has three elements: thinking holistically, expecting uncertainty, and encouraging cooperation. The emerging framework provides a structure for making decisions that incorporate these elements.

The new framework can be viewed as being made up of three levels: the project level, the regional level, and the macro level. Projects and other specific, often localized, actions are the means by which water management policy is actually implemented.[186] The overarching macro level provides strategic leadership for water planning through generalized goals and objectives. However, it is at the regional level that the implementation of strategic goals and objectives through specific projects and actions is harmonized with the region's water and climate-related needs and characteristics. Each of these three levels has its own characteristics, its own area of competence and expertise, and its own set of legal structures and tools.

[186] "Project," in this sense, includes not only actions that lead to physical changes, but activities or programs that are designed to produce specific outcomes or behaviors. Like the term "project" as used in the California Environmental Quality Act, it encompasses more than a built product. But unlike that definition, it can include actions that do not lead to a change in the environment. *See* CAL. ENVTL. QUALITY ACT, *supra* note 104.

1. The Project Level

The project level is where specific actions or projects are proposed and, if approved, carried out. Projects serve identified benefits for specific interests. In the case of water-related projects, these interests can be categorized as urban, rural, and environmental. Projects are usually designed to provide a defined benefit to one of these interests. For instance, a project's purpose might be to provide good quality water for drinking, or to develop a reliable water supply for irrigated agriculture, or to protect or to create habitat. Ideas for projects can come from the bottom up, from individuals and local entities. They can also come from the top down as part of a strategic plan. Ultimately, however, they must be carried out at the project level.

At the core of project development is the involvement of individuals who live in the area where the project will take place, recognizing that local interests have unique and specialized knowledge. Examples of project-level activities include concrete projects such as building a water quality improvement plant or activities such as an ordinance to limit growth to particular parts of a county. Project proponents can be local governmental units such as cities, counties, water districts, or local nongovernmental organizations such as a community group that supports restoring a local stream. The tools used at the project level can include local regulations and approvals for projects, contracts to build projects or carry out actions, permits and licenses, issuance of bonds, and development of other funding or financial agreements.

2. The Macro Level

The macro level is the general or most strategic level.[187] At the macro level, policymakers, including legislators, cabinet level administrative agencies, state level departments, and, in the case of ballot measures, voters, establish basic policies that pertain to all regions and localities. The tools used at the macro level encourage desired general outcomes, behaviors, or actions. The tools include promulgation of general guidance such as executive orders or enactment of laws, regulations, and guidelines that can discourage actions that would impede the realization of the desired outcome. They can also provide incentives to encourage achievement of the desired outcome.

An example of general goal-setting at the macro level is the *2014*

[187] *Macrolevel*, DICTIONARY, dictionary.reference.com/browse/macrolevel (last visited Apr. 26, 2014). Another term sometimes used to express the same concept is "landscape."

California Water Action Plan. The *Plan* provides general direction for state agencies over a five-year period without dictating what specific projects must be used to accomplish the objectives of the plan.[188] Examples of incentives include grants supported by money from general fund bonds to encourage regional water management planning entities to incorporate climate change in their planning considerations.[189]

The macro level can also be the best level for developing baseline data that would be used in more than one region.[190] For example, the California Department of Conservation's Farmland Mapping and Monitoring Program produces maps and statistical data used for analyzing impacts on California's agricultural resources. This state-wide database, maintained since 1982, provides a valuable resource for water management planning, as well as for other uses, on a number of characteristics, including soil quality and irrigation status.[191]

The macro level is also the right level for developing innovation tools that require skills or funds not available at the regional or project level. An example is developing tools that can measure carbon in the soil, thus helping set the stage for carbon markets.[192] This information can help provide a more effective assessment of impacts that may result from ongoing and potential actions, and it can help support strategic decisionmaking.[193]

3. The Regional Level

The regional level is where the general, macro level policies are applied to specific projects through integrated management. If a project is considered only in isolation, it can be inconsistent with broad policy

[188] CAL. NATURAL RES. AGENCY, *supra* note 2.

[189] CONRAD, *supra* note 143, at 16-19. Evidence of the effectiveness of such incentives may be reflected in a recent assessment, which concluded that all regions are, at a minimum, considering GHG emissions and some are looking at adaptation. The paper noted that while there are significant differences in what regions are doing to consider climate change, all are doing something. It made a number of recommendations on how to improve climate change analysis in IRWM plans.

[190] *Id.* at 45-48. For example, Conrad identified a number of activities the state could carry out to support IRWMs in its analysis of climate change. These ranged from support in how to analyze flood risks and ecosystem impacts to more specific guidance on the use of specific down-scaled climate change models.

[191] *Farmland Mapping and Monitoring Program*, CAL. DEP'T OF CONSERVATION, www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx (last visited Apr. 26, 2014).

[192] Emma C. Suddick et al., *Monitoring Soil Carbon Will Prepare Growers for a Carbon Trading System*, 67 CAL. AGRICULTURE 162 (July-Sept. 2013), *available at* californiaagriculture.ucanr.org/landingpage.cfm?article=ca.v067n03p162&abstract=yes.

[193] For examples of other macro level support activities, see 1 CALIFORNIA WATER PLAN UPDATE 2005, *supra* note 9, at 2-8, 2-12, 2-19 to 2-24.

goals and can unnecessarily compete with other projects. If actions at the macro level become too specific or too burdensome, they can become barriers to effective action. The regional level can promote multi-objective planning that takes into account the unique characteristics of the region and that provides for the balancing of preferences and priorities associated with projects.

In the context of the emerging framework discussed in this Article, the word "region" is used to mean the geographical area that encompasses a network of potential or real actions and reactions that connect a community of actors, economically or through other shared interests, values, or customs. In other words, a region, in effect, is the geographic locus of those connections. The Napa Valley can be considered a "region" in a purely geographical sense, since it is a "valley." But it also coincides with the cultivation of grapes and the making of wine, and it is known as a region characterized as such, made up of farmers who grow grapes, winemakers who turn the grapes into wine, hoteliers who accommodate the tourists who visit the region to taste the wine, people who work in the vineyards, wineries, and hotels, and the myriad other merchants and business interests and the people they employ who in one way or another are connected to or affected by the grape and wine industry in the valley. In a way, a "region" is like an "ecosystem," defined in terms of constituent elements that depend on or affect one another.

Water management planning regions can often be delineated by geographical features such as hydrologic regions, watersheds, or natural resource corridors, or by geographical boundaries such as oceans, rivers, and mountains. However, the distinguishing feature is that, in order for it to be a "region" as that word is used in this Article, it must reflect a set of common characteristics relating to water resources that set it apart from other regions.[194]

An *integrated* region, then, is not just a place of connections, but also a place where these connections are managed in an efficient and effective way. The system as a whole determines how the parts behave and affect each other. Integrated regional planning takes into account the multitude of interests and actors whose actions and reactions affect one another and endeavors to harmonize their goals.

How a region is established will depend to some extent on who wants to establish the region and why. The self-determining approach used to develop California's IRWM regions is an approach that seems to

[194] Niles et al., *supra* note 154, at 7.

be working for that program.[195] Under that approach, an IRWM region is not based solely on geographic considerations or characteristics. Water management issues, its stakeholders, and water-related conflicts also define it.[196] Guided by criteria established by DWR, members of each region come together because they share an interest in how the region manages its water resources.[197]

The governance of a region can range from very formal institutional arrangements, such as a joint powers authority, to very informal memoranda of understanding.[198] The legal tools used at the regional level include applications for grant or loan funding, funding and financial agreements, and interagency agreements. An example of an integrated water management region in California is the Santa Ana Watershed Project Authority (SAWPA). SAWPA is a Joint Powers Authority whose five members are water agencies. As such, it carries out functions useful to its members. The agreements formalizing the current agency went into effect in 1975.[199]

SAWPA undertakes water-resource-related collaborative planning and implementation activities with multiple agencies and organizations, in addition to its member units, throughout the watershed. These joint efforts operate under formal and informal agreements.[200] The Santa Ana Regional Water Quality Control Board is often a party to these agreements. SAWPA was the lead agency for developing the region's IRWM plan, which was developed though an outreach program designed to invite participation from the bottom up.[201] It will coordinate the region's application to DWR for funding pursuant to the IRWM grant program, which sets general statewide goals and preferences. SAWPA has an online form that project proponents can use to submit projects to be considered for inclusion in the next round of funding.[202]

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[195] *See* HANAK ET AL., *supra* note 13, at 199-249, for a proposal that would create regional stewardship authorities to coordinate and focus the supply, quality, flood, and ecosystem management efforts of local entities.

[196] *See* CAL. DEP'T OF WATER RES. ET AL., *supra* note 85, at 77-84.

[197] CONRAD, *supra* note 143, at 46. As regions become more established and better understand the connections that make them a region, they may reach out to collaborate with other regions. Conrad points out that at least sixteen different IRWM regions are exploring collaboration with other IRWM regions on climate change.

[198] For IRWM program examples, *see supra* note 71.

[199] *Meet Us,* SANTA ANITA WATERSHED PROJECT AUTH., www.sawpa.org/meet-us/ (last visited Apr. 26, 2014).

[200] *Collaboration*, SANTA ANITA WATERSHED PROJECT AUTH., www.sawpa.org/collaboration/ (last visited Apr. 26, 2014).

[201] *About OWOW, supra* note 151.

[202] *Project Submittal Form,* SANTA ANITA WATERSHED PROJECT AUTH.,

C. WHAT MUST WE DO TO ADAPT?

1. As to All Participants

As discussed in Parts III and IV, the road that has led to a synthesis of integrated regional water management and climate change planning involves a significant change in the way participants involved in water resources decisionmaking address issues of water management. All participants are being affected by this evolution in the legal and political context. They include, among others, lawmakers, regulators, tribal interests, water board members, farmers, urban water users, environmental groups, developers, business interests, farmworkers, and labor unions.

Participants in the emerging framework must understand the proper role each level of the framework plays and where they fit into that framework. The expertise and competence needed to construct a specific project do not reside at the macro level. For that reason, among others, macro level policymakers must recognize that micromanagement of local decisions from the Olympian heights of the macro level will interfere with the functioning of the framework. Their role, instead, is to work closely with regions to establish a vision that integrates local needs with interests at the state, national, and global scale.

Likewise, a planner or manager at the regional level must recognize both the importance of implementing the general guidance emanating from the macro level and the importance of doing so in a way that recognizes all the interests in the region.

At the project level, local officials and interests, including developers and water districts, must avoid focusing on parochial interests and being indifferent to how their projects or needs affect others in the same region. They must accept the fact that their projects and proposed actions must be evaluated in a regional context that implements the general guidance and vision that comes from the macro level and that doing so will, in both the short and long term, help them achieve their specific goals.

2. Lawyers Must Also Adapt

To keep up with current thinking and to help their clients, lawyers, too, may have to change how they work to solve problems. In the

www.sawpa.org/owow/project-submittal-form/ (last visited Apr. 26, 2014).

universe of participants in water management (and in virtually any area in which they play a role), lawyers present a special case. Unlike most of the other types of participants, their professional goal may differ from that of other participants. Lawyers generally do not have a direct, immediate attachment to the subject, but rather are connected to it through their clients. As lawyers, their professional goal is to assist their clients, not to advance a particular policy. Although many lawyers often end up representing the "same side" all the time, they are not obliged to do so. For instance, there is nothing to prevent a lawyer from representing a developer in one case and an environmental group in another.

Adversarial ways of resolving conflicts will always be part of what lawyers do to serve their clients. However, one of the most important things lawyers can do today to help their clients is not to just think like the stereotypical "lawyer" whose job is to help the clients win regardless of the consequences to others. Lawyers can help their clients by understanding the approach explored in this Article and recognizing that its application can help achieve the clients' long-term goals and objectives.

Helping clients in this way will require a different or modified set of legal skills that are geared toward more consensual ways of resolving conflicts—cooperation and openness that can lead to success for all parties. In many cases, all parties can be winners. As in engineering, legal solutions may be more sustainable when they consider life-cycle costs, not merely near-term tactics and victories. The client's best interests, particularly in the long-term, may benefit from solutions that benefit potential or actual opponents as well.[203]

VI. CONCLUSION

Traditionally California water planning was developed in a compartmentalized way and relied on information based on historical hydrologic and climatic variations. Competition for diminishing resources and changing circumstances has required us to rethink how we manage our water resources. Two planning paths—integrated regional water management and climate change planning—have been unified in California. California's experience provides an approach and a

[203] Solving legal problems in this way is not new. Mediation is a process that has been used successfully in many legal conflicts. There are also many facilitation models, based on collaboration, that have been used to resolve thorny issues. Both mediation and facilitation can provide sound methods and tools that can be helpful under this new framework.

framework that can be applied, in the United States and elsewhere, to assist in establishing multi-use and multiple objective plans that can help lead to a more resilient and sustainable future.